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IMPROVING RAPID ACQUISITION: A REVIEW OF THE RIVERINE COMMAND BOAT PROCUREMENT

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December 2013

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The Naval Expeditionary Combat Command procured the riverine command boat (RCB) under a General Services Administration multiple-award schedule contract. Four factors made this acquisition successful. First, an urgent requirement was identified. The global war on terrorism precipitated the need for a fast, maneuverable, highly lethal, and globally deployable naval riverine craft. Second was the ready availability of a proven commercial product; the RCB is a successful Swedish product. Third, the cost was within a procurement threshold that allowed its rapid acquisition. Fourth, funding was available. The approvals of the Bob Stump National Defense Authorization Act (NDAA) for fiscal year 2003 and the Ronald Reagan NDAA for fiscal year 2005 were the key legislative elements that enabled the RCB's swift acquisition, relaxed procurement restrictions, and allowed warfighters' access to systems such as the RCB.

Though this procurement satisfied immediate naval requirements, readiness shortfalls later revealed that the acquisition had failed to address the life-cycle management of maintenance and sustainability. This MBA project analyzes shortfalls in the process used to acquire the RCB and recommends improvements in life-cycle management, as it pertains to acquisition, maintenance, and sustainability.

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ABSTRACT

The Naval Expeditionary Combat Command procured the riverine command boat (RCB) under a General Services Administration multiple-award schedule contract. Four factors made this acquisition successful. First, an urgent requirement was identified. The global war on terrorism precipitated the need for a fast, maneuverable, highly lethal, and globally deployable naval riverine craft. Second was the ready availability of a proven commercial product; the RCB is a successful Swedish product. Third, the cost was within a procurement threshold that allowed its rapid acquisition. Fourth, funding was available. The approvals of the Bob Stump National Defense Authorization Act (NDAA) for fiscal year 2003 and the Ronald Reagan NDAA for fiscal year 2005 were the key legislative elements that enabled the RCB's swift acquisition, relaxed procurement restrictions, and allowed warfighters' access to systems such as the RCB.

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TABLE OF CONTENTS

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LIST OF FIGURES

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LIST OF TABLES

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LIST OF ACRONYMS AND ABBREVIATIONS

3-M	Maintenance and Material-Management System
AAC	acquisition advice code
ACAT	acquisition category
ALT	administrative lead-time
AMD	average monthly demand
APL	allowance parts list
ASI	automated shore interface
ATC	allowance type code
CAS	cost account standards
CFR	Code of Federal Regulations
CMP	Class Maintenance Plan
CNO	Chief of Naval Operations
COSAL	Consolidated Shipboard Allowance List
COTS	commercial-off-the-shelf
CRF	Coastal Riverine Force
CRG	Coastal Riverine Group
CRS	Coastal Riverine Squadron
DAG	Defense Acquisition Guidebook
DAS	Defense Acquisition System
DAU	Defense Acquisition University
D-Level	depot level
DLA	Defense Logistics Agency
DoD	Department of Defense
DSS	Decision Support System
DTO	direct turn-over
FEDBIZOPS	Federal Business Opportunities
FLC	Fleet Logistics Center
FMP	Fleet-Modernization Program
FY	fiscal year
GCPC	government commercial purchase card

GSA	General Services Administration
GWOT	Global War on Terrorism
ICD	Initial-Capabilities Document
ILS	integrated logistic support
I/S	in-stock
JCIDS	Joint Capabilities Integrated and Development System
KO	contracting officer
LCSP	life-cycle sustainment plan
MAS	multiple award schedule
MILSTRIP	military standard requisitioning and issue procedures
MIP	maintenance index page
MRAP	mine-resistant ambush protected
MRC	maintenance requirement card
NAVSEA	Naval Sea Systems Command
NAVSUP	Naval Supply Systems Command
NC	not carried
NDAA	National Defense Authorization Act
NECC	Naval Expeditionary Combat Command
NIS	not in-stock
NSLC	Naval Sea Logistics Center
NSN	national stock number
NSTM	Naval Ships Technical Training Manual
NSWCCD	Naval Surface Warfare Center, Combat Craft Division
NTCSS	Naval Tactical Command Support System
NWCF	Navy working capital fund
O-Level	operational level
O&S	operations and support
OEM	original equipment manufacturer
OMMS-NG	Organizational Maintenance Management System—Next Generation
OPN	other procurement, Navy
OPTAR	operating target

OSD	Office of the Secretary of Defense
PBL	performance-based logistics
PEO	program executive office
PLT	production lead-time
PM	program manager
PMS	Planned Maintenance System
PPBE	planning, programming, budgeting, and execution
PSD	program support data
R&D	research and development
RAB	riverine assault boat
RCB	riverine command boat
RFQ	request for quote
RGS	Requirements-Generation System
ROH	regular overhaul
RPB	riverine patrol boat
SAP	simplified acquisitions procedure
SECDEF	Secretary of Defense
SECNAVINST	Secretary of the Navy Instruction
SKED	schedule
SME	subject-matter experts
SOM	SUPSHIP Operations Manual
SOP	standard operating procedures
SUPSHIP	Supervisor of Shipbuilding
SYSCOM	systems command
TLSCM	total life cycle system management

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I. INTRODUCTION

A. THE PURPOSE OF THIS RESEARCH

In this project, we seek to improve the readiness and life-cycle sustainment of weapon systems procured through rapid acquisition. We evaluate how the Navy used rapid acquisition to procure riverine command boats (RCBs) in 2007, and find a correlation between the acquisition strategy the Navy employed and the readiness problems experienced after Navy Expeditionary Combat Command (NECC) received the boats. We examine ways to improve the current rapid-acquisition strategy, with a focus on maintenance and supportability. In our research, we ask the following questions:

- Why did supply-system support and maintenance problems arise after procurement?
- Did the RCBs have proper provisioning and allowancing?
- What could have been done differently about support and maintenance by changes in provisioning and allowancing?
- Are there alternative ways of supporting RCBs?

B. BACKGROUND

1. History

The U.S. Navy has fielded some type of riverine capability in every conflict in which it has engaged (Benbow, Ensminger, Swartz, Savitz, & Stimpson, 2006). Historically, naval riverine operations are conducted jointly with the Army or Coast Guard. After a major conflict, the Navy customarily stands down its riverine units; nevertheless, the Navy has always equipped, trained, and maintained a strong force in time of need (Benbow et al., 2006).

In 2005, the Global War On Terrorism Working Group identified the need for a naval riverine and expeditionary capability. During this time, the Navy was seeking ways to accomplish riverine missions in Iraq. Riverine Command Group One was established when Fleet Forces Command issued an order for every naval riverine force to be deployed in support of the global war on terrorism

(GWOT). As a result, three riverine squadrons were organized, putting the United States Navy back in the riverine business for the first time since the Vietnam War (Benbow et al., 2006).

2. Command Organization

In January 2006, Fleet Forces Command established the NECC as the single functional command responsible for all Navy expeditionary forces. One of the 10 component commands of the NECC is the Coastal Riverine Force (CRF), composed of Riverine Command Groups One and Two, which are responsible for the seven coastal riverine squadrons (CRSs).

Each CRS consists of over 300 active and reserve sailors and a complement of 12 riverine boats: four assault boats (RABs), six patrol (RPBs), and two command boats (RCBs), as shown in Figure 1.

Figure 1. Boats Constituting a Riverine Squadron (from Thompson, 2011)

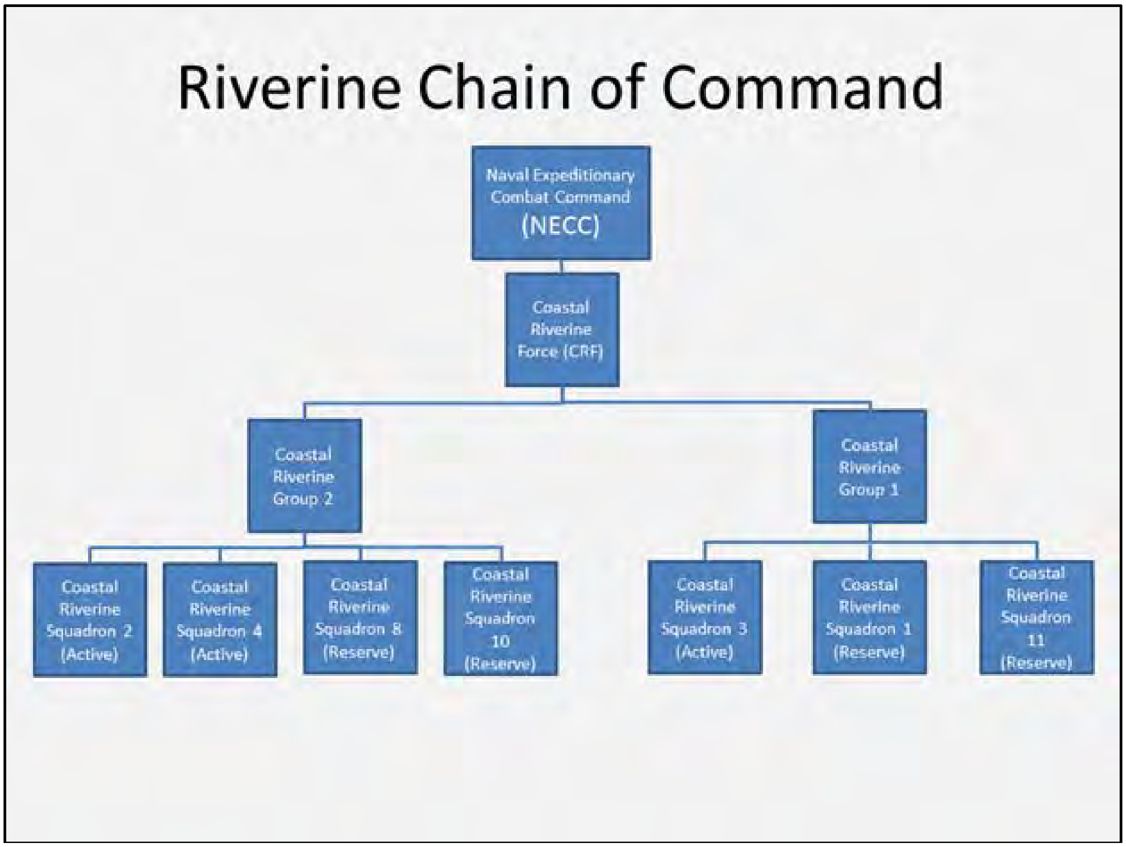

Figure 2. Riverine Chain of Command

3. Riverine Command Boat Requirements

In November 2006, Commander Riverine Group One (CRG-1) released a list of requirements to Program Executive Office Ships (PMS325G) for what would become the RCB. CRG-1 needed a boat to serve as a liaison between commanders onshore and the smaller RABs and RPBs on the river. Besides specific military functions not available on commercial, civilian craft, three key requirements had to be met by the RCB. First, it had to be portable over land by military trucks such as the M1088 or MTVR-A1 five-ton, fifth-wheel tractor. Second, the boat had to meet a cruising speed of 35 knots and a sprint speed with full combat load of 40 knots. It needed to turn 180 degrees within two boat lengths and accelerate from 0–25 knots in 15 seconds.

Third, the boat needed to endure 24-hour missions and 0600–1000 hours of operation a year. It had to have a range of 250–300 nautical miles and the ability to handle sea-state-2 conditions.

These requirements drove the acquisition process. Figure 3 lists the RCB characteristics of the boat selected.

Figure 3. Riverine Command Boat (from Thompson, 2011)

4. Acquisition

Three agencies collaborated in the RCB acquisition: the NECC, the Naval Sea Systems Command (NAVSEA), Program Executive Office (PEO) Ships PMS325G, and the Naval Surface Warfare Center–Carderock Combatant Craft Division (NSWCCD). The requirements for the boat first originated from end users, as represented by NECC, and were communicated to the program manager responsible for procurement, PMS325G. PMS325G worked with the

CCD, who provided testing, life-cycle support, and management of boat inventory. The NSWCCD worked closely with NECC users and industry before, during, and after weapon-system acquisition, focusing on three areas: research and development, acquisition, and in-service engineering (Thomas, 2009). The CDD was responsible for the life-cycle support of the new boats. Figure 4 illustrates the relationships among the agencies involved.

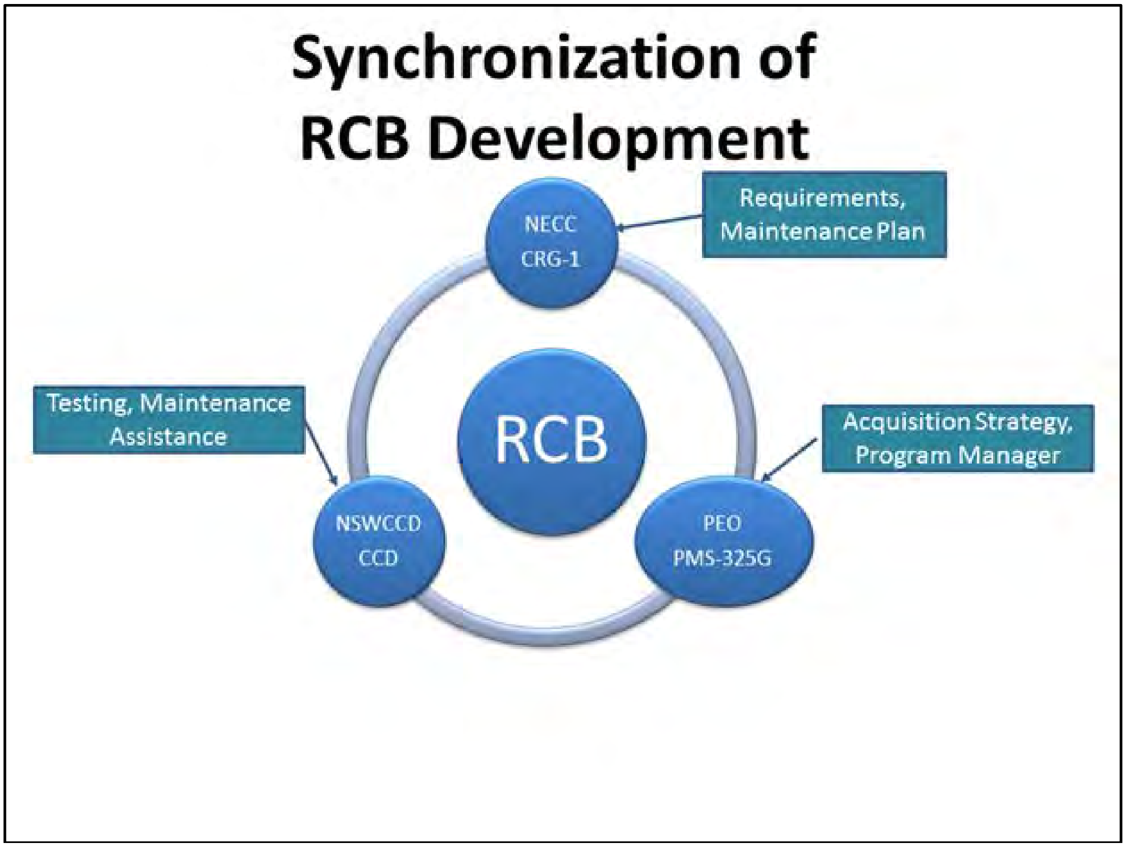

Figure 4. Synchronization of RCB Development

The CCD works with a customer to determine whether its requirements can be met by existing assets, or whether a new system needs to be procured. The CCD may use existing inventories "as is" or apply engineering solutions to meet requirements. If nothing suitable is in stock, the CCD works with the customer and industry providers to find a solution that meets Navy needs, then works with PMS325G to procure it (Thomas, 2009).

In August 2006, NECC, which was responsible for standing up riverine squadrons, signed a memorandum of understanding with PMS325G (Copsey, 2009) to become the program office for RCB procurement. PMS325G handles the non-ACAT acquisitions of small boats, based on mission needs and operational requirements (Coughlin, 2011), and specializes in using General Service Administration (GSA) multiple-award schedule (MAS) contracts to procure commercially-available boats that fit customer requirements (Coughlin, 2011).

The CCD began its research on riverine craft between 2006 and 2007**.** The Swedish-designed, high-speed combat boat CB-90, built in the United States by Safe Boat International, was a possible solution. Originally developed in the late 1980s, this boat has been used by several countries, in various design formats, for military and commercial uses. The CCD ordered the first RCB, and it was awarded as a sole-source contract to Safe Boats International at a cost of $2.3 million in September 2007. Designated RCB-X, it was delivered to CDD in December 2007 for operational testing and evaluation (Coughlin, 2011).

Once the RCB-X was found acceptable, RCBs for operational use by the NECC squadrons were put on contract and ordered by PMS325G. They were on contract before the delivery of RCB-X to the CCD, as PMS25G ordered the first RCB in June 2007. Additional funding for a second RCB was required and provided through a congressional supplement. This RCB was delivered in August 2008. In April 2008, the final five RCBs were ordered, with deliveries between July 2009 and December 2010 (C. E. Rozicer, personal communication, May 1, 2012).

That the RCBs were procured before the CCD completed testing and that the CCD did not establish an ILS strategy for maintenance and sustainability proved to be concerns, as discussed in the sections that follow.

5. Maintenance Supportability

The RCBs came to the fleet without an established maintenance program. Maintenance was initially conducted by end users, working with OEM manuals and repair parts. In January 2011, the CCD generated maintenance-requirement cards (MRCs) and maintenance index pages (MIPs), followed by a class-maintenance plan (CMP) in February 2013. The CMP covers all maintenance requirements for the RCB. It was published more than five years after the RCB-X was first delivered.

Safe Boat, the original-equipment manufacturer (OEM), was responsible for providing maintenance training and procedures to the end user. Accordingly, the RCB units sent personnel on temporary duty to a three-week training session at which Safe Boat provided operator training, equipment familiarization, and basic craft maintenance (R. Cooley, personal communication, August 28, 2013). Safe Boat also provided a commercial repair kit for scheduled and corrective maintenance. Once these kits were exhausted, the unit ordered repair parts and kits directly through the OEM (D. Ellington, personal communication, August 9, 2013).

Under this ad-hoc system, readiness problems began to develop, indicating there were difficulties with maintenance supportability. First, the operational tempo (OPTEMPO) of the craft soon overwhelmed the maintenance capabilities of OEM-trained personnel. As increases in OPTEMPO accelerated normal wear and tear, repair and maintenance needs raised beyond what personnel had been trained to repair. This led to downtime as units waited for OEM technical representatives to conduct repairs (R. Cooley, personal communication 28 Aug 2013).

Personnel training itself became an issue. The Navy customarily trains sailors to a certain technical level before sending them to the fleet. Armed with knowledge and limited experience, sailors report to the fleet and work in an assigned billet. In the case of the RCB, sailors were sent to training *after*

reporting to the unit (R. Cooley, personal communication, August 28, 2013). This had repercussions on manning, because units had to pull from within and make manning sacrifices to satisfy training requirements. This was especially difficult for units preparing for deployment or on deployment that could not afford compromises.

These factors—the lack of adequate maintenance support, the increased OPTEMPO, and insufficient training—limited the availability of the RCBs and delayed mission readiness.

6. Sustainment Strategy

Besides lacking a maintenance strategy, the RCB had no adequate life-cycle sustainment strategy. Despite the CCD's collaboration with NECC, significant life-cycle functions went unaddressed. First, initial outfitting and allowance for repairs or stock parts was nonexistent. Thus, when a part was needed, it was open purchased through a commercial vendor, using a government credit card, or by a contract through the Fleet Logistics Center (FLC). Second, there was no mechanism to track demand for repair parts, because an open purchased repair part circumvents the supply system. Had the parts been requisitioned through the supply system, each demand would have been recorded and the data used to determine future stocking. As data accumulated, it would have accurately indicated which items a unit should carry to support deployment. Because data was no recorded, it was impossible to forecast requirements accurately, and readiness suffered (K. E. Doyne, personal communication, May 2, 2012).[1]

C. BENEFITS AND LIMITATIONS OF RESEARCH

This project improves the acquisition process used by warfighters in unknown environments by reviewing the rapid-procurement and life-cycle processes for the RCB and by considering alternative approaches. We review

[1] Mr. Doyne shared an e-mail originating from RDML Lewis, PEO Ships, to RADM Heinrich, NAVSUP, discussing the RCB logistics support.

the life-cycle-logistics functions of supply-system support, provisioning, and allowancing, and propose an improved rapid-acquisition process.

For this research, we collected data from riverine-squadron subject-matter experts (SMEs) at Naval Sea Logistics Support Center and various entities in the supply system, including Naval Supply Systems Command (NAVSUP) and RCB users. The scope of this research is confined to the rapid acquisition of the RCB platform and its effects on cost and readiness. A dearth of repair records and supply-requisition histories limited this inquiry.

D. METHODOLOGY AND ORGANIZATION

We first interviewed various stakeholders to understand the problem, focusing on end users from NECC and riverine squadrons that suffered readiness problems. To yield qualitative and quantitative data, we interviewed SMEs from the program-management offices, PEO ships, as to why certain procurement decisions were made and what corrections were attempted.

We analyzed the data to identify hurdles that reduced material readiness and to generate recommendations (e.g., for improvements in tracking the demand for open purchased items). In the future, the availability of historical demand data for routinely procured items can be expected to result in appropriate allowancing decisions.

This report is organized along three lines of inquiry: how RCB readiness was compromised by deficiencies in the rapid-acquisition process, by the lack of focus on maintenance supportability, and by an inadequate life-cycle-sustainment plan. The central topics explored are acquisition, maintenance, and sustainment. Chapter I begins by looking at the organizational structure involved and Chapter II processes this information Chapter III discusses how information is organized and used to develop the approach for analysis found in Chapter IV. Recommendations are in Chapter V.

II. REVIEW OF LAWS, POLICIES, AND PROCEDURES

A. INTRODUCTION

The 9/11 attack significantly changed how the nation supplies the warfighter's requirements. In the aftermath of this crisis, laws were amended to streamline communications between combatant commanders and acquisition offices, and the burdensome process for supplying the warfighter was eased. The RCB was one of many rapid acquisitions made as the DoD ramped up the war on terrorism. Studying the process by which the RCB was acquired illuminates how a new rapid-acquisition capability brought mixed results: both immediate advantage to the warfighter and deficient life-cycle-maintenance structures. A formal maintenance doctrine for the RCB was never written, and the result was that of inconsistent practices in the squadrons. The problem was not addressed until the publication of a class-maintenance plan (CMP) in February 2013, which standardized maintenance requirements and periodicities (DoN, 2013).

There was no opportunity within the rapid-acquisition process to address sustainment issues. Just as maintenance requirements were not considered in the procurement, there was no sustainment plan to ensure that units remained operational. This oversight decreased readiness in practical ways. There were no initial allowancing and stock levels; units were forced to rely solely on commercial vendors, with no organic supply-system support, and there was no formal tracking of supplies to monitor demand and inventory levels.

B. THE ACQUISITION PROCESS: AN INTRODUCTION

The Defense Acquisition System (DAS) is the DoD's formal system for acquisition and follows guidelines set forth in the DoD 5000 series first released in 1971. It is a milestone-driven, low-risk process that focuses on cost, schedule, and performance. The goal at the end of the DAS process is to have weapon systems that are supportable and affordable throughout their life cycle. Under the

DAS, considerations for the support of a weapon system begin at the start of the acquisition process, which may take 12–25 years to field a system (Farmer, 2012).

The initial procurement of the RCB started in 2008 under the abbreviated acquisition program (R. Jones, personal communication, NSWCCD, August 9, 2013). This program was designed for small DoN acquisitions that did not require operational testing and evaluation (OT&E) and were within specific dollar thresholds, namely,

- development (< $10 million)
- production or services (< $25 million per year or < $50 million per year total (Secretary of the Navy Instruction [SECNAVINST], 5000.2e, 2011).

Before further discussion of the RCB acquisition, it is important to understand briefly the DoD procurement system and how exactly the RCB fits in. The DAS is one of three processes that weapon-system procurements must go through. All weapon systems procured by the DoD must meet a specific military requirement, as determined by the joint-capabilities integration and development system (JCIDS) process; must be funded as part of the federal budget through the planning, programming, budgeting, and execution (PPBE) process; and must be procured through the DAS (Schwartz, 2013).

1. Joint Capabilities Integrated and Development System

All DoD requirements are vetted through the JCIDS process. The JCIDS was created in 2003 as a shift from the previous threat-based, service-driven identification model known as the requirements-generation system (RGS), to favor a joint capability-based approach (Schwartz, 2013). The purpose of the JCIDS is to review service capability requirements at a joint level, identify whether capability gaps exist, and determine whether a material solution is required. Redundancy is eliminated and resources are used efficiently with a joint, as opposed to a service-level, review. If a material solution is required, the Joint Requirements Oversight Committee (JROC) will approve an initial-

capabilities document (ICD). The approved ICD then justifies a requirement, and the need proceeds to the DAS process (Chairman of the Joints Chiefs of Staff Instruction, [CJCSI] 3170, 2012).

2. Planning, Programming, Budgeting, and Execution

The funding for a weapon system occurs in the PPBE process. In the planning phase, the requirements received from combatant commands are analyzed. In the programming phase, proposed programs are presented in a program-objective memorandum (POM) for review and integration into the budget. Budgeting happens concurrently with the programming phase and results in a budget decision that is approved by the Office of the Secretary of Defense (OSD). Simultaneous with the program and budget phase is the execution phase, where programs are evaluated under performance metrics, which may result in a budget adjustment.

3. Defense Acquisition System

In the DAS, each acquisition program is managed by a program manager (PM). For the RCB, the PM is PMS325G, falling under NAVSEA PEO Ships. PMS325G manages all small-boat programs, including the RCB. Programs are divided into acquisition categories (ACATs) according to their dollar value. For example, as shown in Table 1, the dollar value for the RCB program places it below ACAT IV in the abbreviated acquisition program, with PEO Ships having authority for the procurement decision.

Table 1. ACAT Description and Decision 1 Authority (from SECNAVINST 5000.2e, pp. 1–23)

Table E1T1 Description and Decision Authority for ACAT I-IV and AAP Programs		
Acquisition Category	**Criteria for ACAT or AAP**	**Decision**
ACAT I	• Major Defense Acquisition Programs (MDAPs) (10 U.S.C. §2430) • RDT&E total expenditure > $365 million in Fiscal Year (FY) 2000 constant dollars, or • Procurement total expenditure > $2.190 billion in FY 2000 constant dollars, or	ACAT ID: USD(AT&L) ACAT IC: SECNAV, or if delegated, ASN(RD&A) as the CAE (not further delegable)
ACAT IA **1/**	• Major Automated Information Systems (MAISs) • Program costs/year (all appropriations) > $32 million in FY 2000 constant dollars, or • Total program costs > $126 million in FY 2000 constant dollars, or • Total life-cycle costs > $378 million in FY 2000 constant dollars • MDA designation as special interest	ACAT IAM: USD(AT&L), or designee ACAT IAC: SECNAV, or if delegated, ASN(RD&A), as the CAE (not further delegable)
ACAT II	• Does not meet the criteria for ACAT I • Major Systems (10 U.S.C. §2302(5)) • RDT&E total expenditure > $140 million in FY 2000 constant dollars, or • Procurement total expenditure > $660 million in FY 2000 constant dollars, or • ASN(RD&A) designation as special interest • Not applicable to IT system programs	ASN(RD&A), or the individual designated by ASN(RD&A)

ACAT III	• Does not meet the criteria for ACAT II or above
	• Weapon system programs:
	  • RDT&E total expenditure ≤ \$140 million in FY 2000 constant dollars, or
	  • Procurement total expenditure ≤ \$660 million in FY 2000 constant dollars, and
	  • Affects mission characteristics of ships or aircraft or combat capability
	• IT system programs:
	  • Program costs/year ≥ \$15 million ≤ \$32 million in FY 2000 constant dollars, or
	  • Total program costs ≥ \$30 million ≤ \$126 million in FY 2000 constant dollars, or
	  • Total life-cycle costs ≤ \$378 million in FY 2000 constant dollars
		Cognizant PEO, SYSCOM commander, DRPM, or designated flag officer or SES official.
		
		ASN(RD&A), or designee, for programs not assigned to a PEO, SYSCOM, or DRPM.

ACAT IVT	• Does not meet the criteria for ACAT III or above
	• Requires operational test and evaluation
	• Weapon system programs:
	  • RDT&E total expenditure ≤ \$140 million in FY 2000 constant dollars, or
	  • Procurement total expenditure ≤ \$660 million in FY 2000 constant 2000 constant dollars
	• IT system programs:
	  • Program costs/year < \$15 million, or
	  • Total program costs < \$30 million, or
	  • Total life-cycle costs ≤ \$378 million in FY 2000 constant dollars
		Cognizant PEO, SYSCOM commander, DRPM, or designated flag officer, SES official, or PM.
		
		ASN(RD&A), or designee, for programs not assigned to a PEO, SYSCOM, or DRPM.

ACAT IVM	• Does not meet the criteria for ACAT III or above
	• Does not require operational test and evaluation as concurred with by OTA
	• Weapon system programs:
	  • RDT&E total expenditure ≥ $10 million ≤ $140 million in FY in FY 2000 constant dollars,
	or
	  • Procurement expenditure ≥ $25 million/year, ≥ $50 million total ≤ $660 million total in FY 2000 constant dollars
	• Not applicable to IT system programs
		Cognizant PEO, SYSCOM commander, DRPM, or designated flag officer, SES official, or PM.
		
		ASN(RD&A), or designee, for programs not assigned to a PEO, SYSCOM, or DRPM.

Abbreviated Acquisition Program	• Does not meet the criteria for ACAT IV or above
	• Does not require operational test and evaluation as concurred with in writing by OTA
	• Weapon system programs:
	  • Development total expenditure < $10 million, and
	  • Production or services expenditure < $25 million/year, < $50 million total
	• IT system programs:
	  • Program costs/year < $15 million, and
	  • Total program costs < $30 million
		Cognizant PEO, SYSCOM commander, DRPM, or designated flag officer, SES official, or PM.
		
		ASN(RD&A), or designee, for programs not assigned to a PEO, SYSCOM, or DRPM.

1/ In some cases, an ACAT IA program, as defined above, also meets the dollar threshold definition of an MDAP. Per DoD Instruction 5000.02 of 8 Dec 2008, enclosure 3, table 1, footnote 1, the statutory requirements that apply to MDAPs or MAIS programs shall apply to such programs, as designated by the Secretary of Defense. Public Law 111-84 of 28 Oct 2009, section 817, subsections (a) and (b), (FY 2010 National Defense Authorization Act), amended section 2445d of title 10, U.S.C., whereby the Secretary of Defense may, as a general rule, designate a MAIS program that requires the development of customized hardware to be treated ONLY as an MDAP under Chapter 144 Title 10, U.S.C., subject to Chapter 144 MDAP requirements, and a MAIS program that does not require development of customized hardware to be treated ONLY as a MAIS program under Chapter 144A of Title 10, U.S.C., subject to Chapter 144A MAIS program requirements.		

A second function of DAS is tracking the progress of a weapon system. Procurements are monitored by milestones that continue throughout the life of a weapon system, as shown in Figure 5. At each milestone, the program is assessed using requirements developed by law, to determine if the acquisition

can continue. Before a system proceeds into the production and deployment phase after Milestone C, it will have been scrutinized under Milestone A to ensure that appropriate technology was developed and under Milestone B to verify that engineering and manufacturing development took place (Schwartz, 2013).

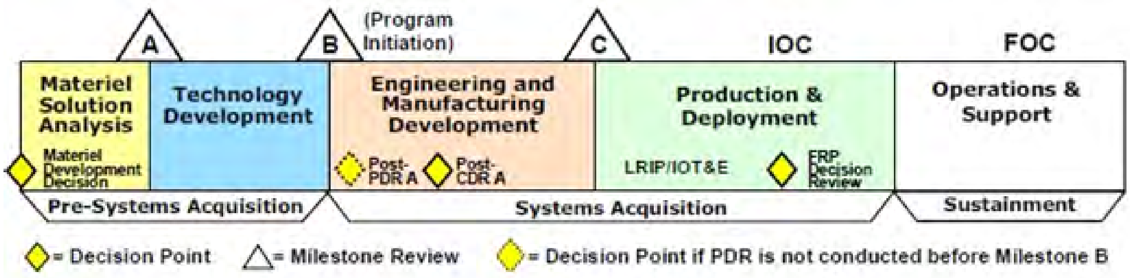

Figure 5. (Defense-Acquisition Milestones (from Office of the Under Secretary of Defense for Acquisition, Technology, & Logistics [OUSD[AT&L]], 2008, p. 12).

C. RAPID-ACQUISITION TOOLS

The shift from the traditional acquisition process to rapid acquisition is described in many places. Because the rapid-acquisition process was conceived to respond to crisis, it differs greatly from traditional acquisition under DAS. Table 2 shows the differences between the threat-based approach of the DAS system and the capability approach of rapid acquisition (Farmer, 2012).

Table 2. Traditional Versus Rapid Acquisition

Traditional Approach	Rapid Acquisition
• Future focused, large ACAT level programs • Driven by structured processes • Mature evolved requirements • Alternatives carefully analyzed • Lengthy development (12–25 years) • High visibility on the program • Large investment	• Immediate need focused, ACAT II and below programs • Streamlined process • Specific unique contingency requirement • High visibility on results • May transition to a normal acquisition program • 75% solution acceptable

Two major pieces of legislation provided the legal tools for rapid acquisition. First was the Bob Stump National Defense Authorization Act for fiscal year (FY) 2003, which became Public Law 107-314. Section 806 of this law, Rapid Acquisition and Deployment Procedures, directed the Secretary of Defense (SECDEF) to:

> prescribe procedures for the rapid acquisition and deployment of items that are:
>
> 1. currently under development by the Department of Defense or available from the commercial sector; and
>
> 2. urgently needed to react to an enemy threat or to respond to significant and urgent safety situations. (p. 151)

Section 806 called for a streamlined communications process among the Chairman of the Joint Chiefs of Staff, the acquisition agencies, and research and development to enable combatant commanders to communicate their requirements quickly and to receive a fast response in terms of proposals. Section 806 also required updating the procedures for rapid acquisition, funding, deployment, and testing of systems either under development or urgently needed.

This law was drastically amended by the Ronald Reagan National Defense Authorization Act for Fiscal Year 2005, which became Public Law 108-375. Section 811, Rapid Acquisition Authority to Respond to Combat Emergencies, greatly expanded what Section 806 had started. It enabled the SECDEF to immediately procure anything deemed “urgently needed to eliminate a combat capability deficiency that has resulted in combat fatalities” (p. 202). With a cap of $100 million per fiscal year and a goal of awarding the contract within 15 days, this was the new face of rapid acquisition. This law also permitted the waiver of certain statutes and regulations. Among them was the ability to:

> waive any provision of law, policy, directive or regulation addressing
> “(A) The establishment of the requirement for the equipment;
> (B) the research, development, test, and evaluation of the equipment; or
> (C) the solicitation and selection of sources, and the award of contract, for the procurement of the equipment.” (p. 203)

The only thing this law did not waive was any law imposing civil or criminal penalties. All barriers to the SECDEF’s ability to acquire a critical requirement were effectively removed. But the law failed to impose sustainability requirements; and as procurement shifted to rapid acquisition, sustainability issues began to emerge (K. E. Doyne, personal communication, May 2, 2012).

The DoD has aggressively exploited commercially available products that can fulfill a need or bridge a gap in weapon-system requirements. While no official tool for rapid acquisition was established, the Federal Acquisitions Regulation (FAR) contains several key provisions that were used in the acquisition of the RCB. As noted, the RCB used a GSA MAS contract for procurement. Despite streamlining the rapid-acquisition process, the requirement to use the FAR for procurement still exists. Coded in law by Title 48 of the Code of Federal Regulations (CFR), the FAR (2013) it defines the rules and regulations for the acquisition of supplies and services by the federal government. This section lays out the tools from the FAR that were used for the RCB procurement.

1. Commercial and Commercial Off-the-Shelf Items

FAR 2.101 defines a commercial item as any item that may be acquired by the general public. A commercial off-the-shelf (COTS) item is one that is sold in considerable quantities in the commercial marketplace. FAR Part 12 encourages the DoD to contract commercial items that meet agency needs. The RCB was available to the public, and was thus a commercial item; it sold in sufficient quantities to be deemed a COTS item.

When a government agency purchases COTS or commercial items, the simplified acquisitions procedure (SAP) applies. The SAP speeds up acquisition

by reducing administrative burdens. The contractor is exempt from cost-account standards (CAS), in accordance with FAR 12.214. The CAS for a non-commercial item requires a contractor to submit certified cost and pricing data for any contract over $700,000, per the Truth in Negotiation Act (TINA) and FAR 30.201. This causes an increased cost for the government because of the administrative and time burden in fulfilling the mandatory audit of the CAS, as required by TINA. These benefits allowed for a reduced acquisition time for the RCB.

FAR Part 12 promotes the use of commercial practices when procuring COTS or commercial items, per Public Law 103-355. However, a commercial practice may restrict the contracting officer's (KO's) ability to negotiate items such as warranties, financing, use of a contractor's quality-assurance procedures, and even technical data. Though the acquisition is streamlined, the KO, according to FAR Part 12, is still required to do many of the basic contracting steps, such as conducting market research, determining price reasonableness, and administering past-performance evaluations.

2. Federal Supply Schedules

The GSA MASs are long-term, indefinite-delivery contracts FAR 8.402 allows federal agencies to use the GSA MAS schedules to simplify the procurement of commercial items. The GSA pre-negotiates fair and reasonable prices with providers of commercial services and supplies. When ordering under the MAS, the process is already considered a full and open competition and does not require going outside GSA-approved contractors. This allows a KO to bypass placing a synopsis. He or she can go directly to Federal Business Opportunities (FEDBIZOPS) to place an order, reducing the acquisition timeline by at least 15 days, as FAR 5.203 requires. The KO can issue a request for quote (RFQ) directly to those contractors with a GSA-scheduled contract for the item needed (General Services Administration [GSA], 2012), though he or she must also post the requirement on the GSA's electronic bulletin board so that any approved

contractor may bid, as required by FAR 8.402(c)(2). The price posted on the MAS is the ceiling price, and the KO may negotiate a lower price. PMS325G used this process to purchase six RCBs for NECC.

3. Test Program for Certain Commercial Items

The RCB-X was purchased as a testing and evaluation platform. It cost was $2.3 million, and was procured by the CCD using the authority of FAR 13.5, the test program for certain commercial items. This allows a contracting officer to award for supplies and services of commercial items that are above the SAP cost threshold but under $6.5 million. Though this program opens large commercial buys for the DoD using the abbreviated SAP, all other SAP actions are still required from FAR 13.1.

4. Summary

The DoD has increasingly used commercially-developed systems to solve military problems. For small- or low-cost weapon systems, the FAR has established several processes to assist in rapid acquisition. While not all contract tools are needed at the same time, the ability to employ the right acquisition method in the acquisition of a commercial system is paramount for success. As shown by the acquisition of the RCB, a rapid acquisition can be successful and promote the use of rapid acquisition. Further review, however, reveals flaws in how maintenance and life-cycle support of the RCB arose after initial procurement.

D. MAINTENANCE SUPPORTABILITY

1. Introduction

Maintenance is critical to weapon-system readiness throughout a program’s life cycle (Chief of Naval Operations [CNO], 2007). Operations and Support (O&S) is the largest component of the DAS, and it is accomplished through a command’s maintenance and material-management (3-M) system.

This section analyzes the 3-M system and reviews policy, processes and applications, and maintenance levels and tasks as they apply to the RCB.

2. Maintenance Policy

Maintenance requirements can be clearly traced through policies. There are four documents establishing RCB maintenance policy: NAVSEA 4790.8C, OPNAVINST 4780.6E, the *Naval Ship's Technical Manual* (NSTM), and the class-maintenance plan (CMP) for the RCB.

a. Ships' Maintenance and Material Management (3-M) Manual

The 3-M manual is the Navy's maintenance bible, providing an overall standard for shipboard preventative maintenance. This includes tasks such as planning, scheduling, controlling, and performing (NAVSEA, 2013b). The 3-M manual assigns specific responsibilities to members of the command. The commanding officer is assigned as overall responsible for the command's 3-M program. The XO, 3-M coordinator (3MC), department heads and enlisted personnel have roles that are outlined in the 3-M manual. In addition, the 3-M manual provides a blueprint for a command's program, outlining the functions and processes needed to establish, manage, and operate a successful 3-M program.

b. Policy for Administering Service Craft and Boats in the U.S. Navy

Just as the 3-M manual describes a 3-M program, the 4780 is the CNO's policy for the life cycle of service craft and small boats, from acquisition to disposal (CNO, 2006). Beginning with procurement, this document assigns NAVSEA responsibilities for boat acquisitions. It directs that service craft and small boats be allowanced appropriately through a coordinated shipboard allowance list (COSAL) and managed under a fleet-modernization program (FMP)—both essential components in life-cycle management. The COSAL

ensures that equipment is allowed appropriate repair parts, while a key component of the FMP is the scheduling of regular overhauls (ROH) and scheduled material inspections.

c. Naval Ship's Technical Manual Boats & Small Craft, Chapter 58, 3 Vol. 1

OPNAVINST 4780.6 contains the CNO's (2006) policy on small boats. NSTM Chapter 583 elaborates on procedures for CNO policy. Boats are formally defined and the responsibilities of PMS325 as program manager (PM) are stated. The publication elaborates on boat management, including aspects such as allowancing, transfers between command, and turn-in at life cycle's end, and acknowledges COTS as an appropriate vehicle for small-boat acquisition.

d. The Class-Maintenance Plan

Just as NSTM Chapter 583, Vol. 1, assigns responsibility for small-boat life-cycle management to PMS325G, PMS325G establishes the CMP as the source of direction on the execution of maintenance, specifically for the RCB. This source document is used to apply the 3-M manual to the RCB. These documents trace maintenance requirements from the 3-M doctrine of NAVSEA and the CNO to the maintenance plan of the program manager and NECC.

3. Maintenance Process and Application

The maintenance doctrines of the 3-M manual and the RCB CMP are executed under three systems: 3-M schedule (SKED), the naval tactical-command support system (NTCSS), and the automated shore interface (ASI) process.

As the software interface used to obtain formalized maintenance procedures, 3-M SKED is the backbone of the 3-M system, managed by the 3-M coordinator (3MC). The CMP lists systems that require maintenance actions, and it is through 3-M SKED that keeps track of completed maintenance.

Administrative functions of the 3MC include scheduling, updating maintenance requirements, and providing procedures for the end user, such as the MRC cards used to perform maintenance.

Just as the 3-M SKED system provides guidance on performing work, the Naval Tactical Command Support System (NTCSS) is the system used to input maintenance items and document what is getting done. Maintenance items may be jobs completed by crewmembers at the organizational level or complex maintenance by shops outside the command, such as a shipyard. [Besides job inputs, parts orders from the system's allowance parts list (APL) can be made through the NTCSS interface.

The ASI is used to update changes in system configurations. As systems are updated, changes occur to the allowancing of repair parts. These changes are documented using the COSAL feedback report and NAVSUP is informed of the current configuration. NAVSUP then generates an ASI based on the update. When the ASI is processed by the command, the databases contained in the unit's NTCSS program are updated, to align the parts on the APL with the command's current configuration and adjust the allowance level.

4. Maintenance Levels and Tasks

Maintenance is of two types: unscheduled and scheduled. Unscheduled maintenance is unplanned, the result of a material failure, and results in corrective maintenance to get the system operational. Scheduled or preventive maintenance is a planned evolution of care that is conducted at regular intervals to maintain operability. Preventative maintenance is managed in accordance with in accordance with the 3-M manual through the Navy's Planned Maintenance System (PMS).

Planned maintenance is conducted at three levels of increasingly difficult procedures: organizational, intermediate, and depot. Organizational (O-level) maintenance is the lowest performed under the PMS system. This routine shipboard maintenance is to keep equipment in a fully mission-capable status.

Intermediate (I-level) maintenance requires more skills than O-level and may require training, resources, and equipment unavailable onsite. Depot (D-level) maintenance is usually completed by special-repair activities, as is beyond the scope of the shipboard technician. Its purpose is to repair and investigate the status of complex systems that are rarely accessed; thus D-level work requires advance scheduling to ensure availability of equipment and personnel. During depot maintenance, the unit may be nonoperational and subsystems disabled. Usually D-level maintenance is scheduled when a unit is in maintenance availability or shipyard overhaul.

As an example of the proportion of repairs typical at each level, per the CMP, the RCB has a total of 79 maintenance items. In addition, 34 are a combination of O/I level; 28 are I-level; and seven are D-level. Table 3 displays various maintenance levels as required by the CMP, with the system, maintenance actions, levels, man-hours and skill level required for repair.

Table 3. RCB Maintenance Levels (from DON, 2013, p. 8-2)

System	Maintenance Actions	Maint Level	Man-Hours	Skill Level
Main Propulsion	Engine Overhaul (As Per Diesel Inspection	D		OEM
	Results	O/I	32.00	EN1/ORA
Diesel Engine (MPDE)	Engine and Marine Gear Replacement	O/I	8.00	EN1/ORA
	Driveshaft Alignment	O/I	8.00	EN2/ORA
	MPDE Muffler Removal and Installation	I	1.00	CAL LAB
	Fuel-Gauge Calibration	O/I	1.00	EN2/ORA
	Fuel-Shutoff-Valve Replacement	O/I	2.00	EN2/ORA
	Emergency Fuel-Shutoff-Cable Replacement	O/I	2.00	EN2/ORA
	Fuel-Injection Fuel-Pump Replacement	O/I	2.00	EN2/ORA
	Freshwater-Coolant Pump	O/I	2.00	EN2/ORA
	Turbocharger Replacement	I	24.00	DEI/ORA
	Engine 18-Month Diesel Engine Inspection			

5. Maintenance Development

The progress of RCB maintenance started with commercial support and evolved to organic Navy-supported maintenance. From December 2007 to January 2011, maintenance was conducted using OEM procedures and supplies. In January 2011, a formal 3-M process began, with the units using Navy-generated MIPs and MRCs (J. Lupyan, personal communication, October 10, 2013). In February 2013, PMS235 released a CMP, formalizing maintenance procedures for the RCB. No maintenance-demand data was captured for the first three years of the RCB's existence.

6. Summary

To achieve maximal effectiveness from equipment, management tools are available to ensure units are performing the maintenance necessary to assure good condition of equipment throughout its life cycle. In the case of the RCB, recipient units lacked the maintenance tools and resources needed to support the craft. This inability to meet maintenance standards degraded the operational readiness of the unit.

E. SUSTAINMENT REQUIREMENTS

In the preceding review, we looked at the evolution in weapon system sustainment as a result of the GWOT. We cited the RCB as an example of how a failure in sustainment planning before acquisition affected mission readiness (H. Lewis, personal communication, 2012). We next review reform actions intended to remedy this defect.

1. Initial Requirements

To review, the requirements for sustainment procedures originated in DoD *Instruction 5000.02* (OUSD[AT&L], 2008), which assigned the responsibility to the PM. The PM ensured a life-cycle sustainment plan was developed during the

material-solution analysis and matured throughout the technology-development phase. The LCSP was a requirement for transitions into Milestone B (OUSD[AT&L]), 2008).

SECNAV 5000.2C issued mandatory procedures for DON major and minor acquisitions. The ACAT listing in Table E2T1 of the SECNAV instruction was expanded from the DoD ACAT listing and included the abbreviated acquisition programs used to procure the RCB. Additionally, the SECNAV instruction provided direction on the rapid deployment capability (RDC) process to respond rapidly to urgent requirements that may later develop in an ACAT program.

The Supervisor of Shipbuilding Operations Manual (SOM) defines the responsibilities for RCB PMs, specifies the elements that comprise integrated logistics support (ILS), explains the role of the ILS manager, and details the provisioning and allowancing process. (NAVSEA, 2013c).

2. Procurement Evolution

a. Public Law 108-375

Following the events of 9/11, several modifications were enacted to enable the rapid acquisition of a critical capability. The most significant was the passage of Public Law 108-375 in 2005, which greatly expanded the power of the SECDEF to fund critical requirements. Two memos from the ASN office took advantage of these legislative changes.

b. ASN Memos

A rapid-acquisition-processing memo released from the ASN (RD&A) office on Dec 4, 2006 classified certain acquisitions as urgent and directed that procurement requests be executed within seven days of receipt. The authority cited was Public Law 108-375, which stated a goal of awarding a contract within 15 days of receiving a requirement. This ASN memo cut award

time in half and called out two types of acquisitions from SECNAVINST 5000.2C: the abbreviated acquisition process (AAP) and the rapid-deployment capability (RDC).

The RCBs were procured under the AAP, as listed in SECNAVINST 5000.2C, on the same table as ACAT programs I–IV. The RDC, which is not listed on the ACAT table, was defined as a tailored approach for managing a capability that might later transition to an ACAT program (5000.2c, 2004).

The ASN (RD&A) memo was updated six months later in response to the volume of rapid-acquisition requests received that lacked incomplete data. The lack of data slowed the rapid-acquisition process; the new memo required that a checklist accompany all RDC requests. Because an RDC program may transition to an ACAT program, the checklist ensured that certain details of the acquisition were addressed.

Of the 11 items on the checklist, two stood out as having been deficiencies identified in the RCB procurement, and direction was given that logistics and long-term maintenance support be addressed. Had these items been addressed during the AAP acquisition of the RCB, much readiness fallout might have been avoided. Table 4 lists the specific items requiring consideration with the submission of an RDC acquisition request.

Table 4. RDC Checklist Requirements

RDC Checklist Requirements	
Long Term Maintenance Requirements	**Logistics Support Requirement**
a. Logistics support plan for RDC supplies. b. Anticipated life-cycle issues c. Warranty provisions d. Demilitarization and disposal e. Life-cycle assessment to address performance, readiness, ownership cost and support issues f. Sustainment strategy funding	a. Logistics support funding b. How will obsolescence be addressed c. Alternate logistic support strategies d. Anticipated technical refresh for RDC supplies e. Logistics workload (i.e. contractor, government supply support)

c. Defense Science Board: Fulfillment of Urgent Operational Needs

In July 2009, the Defense Science Board Taskforce released a report on the fulfillment of urgent operational needs. This document addressed the DoD's goal of expanding the rate at which requirements were fielded. It faulted the present acquisition process, which was focused on deliberate acquisitions, and stated it was unable, in its present condition, to focus on "rapid" acquisitions.

d. Summary of Findings

The task force had six findings and five recommendations. The findings are as follows:

1. Because the DoD needs differ with each rapid-acquisition requirement, using the same process for different requirements is ineffective. The DoD needs a completely different process.
2. The acquisition workforce is not trained for rapid acquisition. It works in a traditional system of complex requirements requiring extreme precision and accuracy, while rapid acquisition demands immediate outcomes—which may be less than optimal.

3. A rapid acquisition must use existing technology and manufacturing; targeting new technologies is time consuming and risky. A process for exploiting what already exists is needed.
4. DoD practices in rapid acquisition are not sustainable. The report criticized the use of ad-hoc practices that lacked the capacity to respond to future requirements. Though the process met initial, short-term need, it could not handle the long term.
5. No triage is applied in rapid acquisition. Ninety percent of the Army's urgent-need requirements are not for a new capability, but simply for more units of equipment or for an item in existing inventory. There is no effective mechanism to identify whether an item is already available.
6. Bureaucratic barriers impede rapid acquisition. The biggest barrier is access to funding.

e. Summary of Recommendations

The study made five recommendations:

1. **Establish a formal dual-acquisition path.** The present procurement process is too structured and demands a 99 percent solution that requires three to 11 years before a capability reaches the warfighter. A dual-acquisition path would put the requirements in different processes to enable deployment of a 75 percent solution in 24 months.

2. **Create a rapid-acquisition fund.** The study recommends a separate account be established to fund urgent requirements, similar to overseas contingency-operations funding (OCO). The study recommends funding of 0.5 percent of the DoD budget, with a cap of $3 billion, which would be replenished annually. Additionally, the study recommends that the funds not expire and not be limited to specific classifications.

3. **Form a rapid acquisition and fielding agency**. The study recommends the formation of a joint agency within the office of the USD (AT&L), similar to the Defense Logistics Agency (DLA) and National Security Agency (NSA). The proposed name is the Rapid Acquisition and Fielding Agency (RAFA).

4. **Build the new agency from existing ad-hoc rapid-acquisition initiatives**. The agency would take on existing programs already in progress. This would create a new organization with new people looking for programs to work on.

5. **Adopt a streamlined approach**. Pursue need, acquisition, and funding issues simultaneously to decrease time to deployment.(OUSD[AT&L], 2009)

The report demonstrated a new emphasis on finding ways to pursue urgent requirements. While it focuses on exploiting existing capabilities, it does not talk about long-term sustainment. Because life-cycle issues are neglected, the report is short-term focused.

3. Life-Cycle Issues

Rapid-acquisition reforms resulted in fast acquisition, but poor sustainment. Concerns quickly ran up the chain of command to flag leadership. In an e-mail communication from PEO Ships, RDML Dave Lewis, to the NAVSUP Commander and Chief of the Supply Corps RADM Mark Heinrich (K. E. Doyne, personal communication, May 2, 2012), RADM Heinrich was asked to help accelerate NAVICP procurement of RCB spare parts, because the RCBs were procured without an ILS strategy.

In his communication, RADM Lewis described the process: PMS 325 is responsible for the acquisition and life-cycle support of the RCB, with the assistance of the CCD, who work with the end user and industry. A problem was that the allowance parts list (APL) was not entered into the Navy supply system until November 2011, nearly five years after delivery of the first RCB and two years after the squadrons first deployed.

Because an APL identifies the parts needed to maintain a weapons system, it is a critical life-cycle-management tool. When maintenance is performed and parts are ordered in the supply system, a demand signal is generated. Over time, as various parts are requisitioned, this demand data is used to establish allowance levels. However, because the allowance levels are generated by recording demand over time, it takes a while to establish accurate levels. The normal time frame to build an effective allowance listing is 18 months after the APL is established.

For the first four years of the RCB life cycle, there was no record of demand to establish allowances. A review of the APL data at the time of RADM Lewis's e-mail indicates there were only 18 national stock numbers (NSNs), and all of them were readily available in the supply system.

Life-cycle logistician Jim Farmer discusses the absence of a sustainment focus in the rapid-acquisition process (Farmer, 2012). Farmer notes that incorporation of sustainment requirements resulted in deployment delays unacceptable to the warfighter. The user requires a 75 percent solution, within the next 2–24 months, and cannot wait for a 100 percent solution in 12–25 years.

Farmer discusses requirements not readily apparent to the customer—big-footprint items such as training, spares, maintenance, facilities, and manpower (Farmer, 2012). None of these concerns was raised during the procurement of the RCB, which was 100 percent commercially supported; no demand signal was recorded to develop allowances (K. E. Doyne, personal communication, May 2, 2012).

Concerns with sustainment are not limited to the RCB or Navy acquisitions. The Army also experienced significant problems, primarily because PMs are unable to devote as many resources to life-cycle management as to procurement. Whitson uses the procurement of the Mine-Resistant Ambush Protected (MRAP) as an example (Whitson, 2012). Though 15,000 MRAPs were quickly fielded, which was determined a rapid-acquisition success, the supply chain for repair parts was full of gaps.

4. Acquisition Reform

In September 2011, the USD (AT&L) memo *Life-Cycle Sustainment Plan* (LCSP) reiterated the importance of the LCSP and confirmed that it had been separated from the acquisition strategy (Kendall, 2011). The goal of separating the LCSP was to revise and improve the sustainment plan for new weapons

systems, and was becoming a requirement for every acquisition program. This later became part of the revised DAG and an update to the DoD Instruction 5000.02 (USD[AT&L], 2011b).

An update followed from the SECNAV. SECNAVINST 5400.15C listed the PEO as responsible for all life-cycle-management programs under its cognizance. This instruction directed that PEOs work directly with Systems Command (SYSCOM) to validate technical processes, and that program managers exercise authority over the entire life cycle of a system, from concept development to disposal (Office of the SECNAV, 2011).

5. Sustainment Review

With the RCB requirements and issues laid out, the question arises, what would happen if the RCB procedure was conducted today? Would it be plagued with the same sustainment issues, or would the new regulations affect appropriate life-cycle-management decisions? Chapters I and II set the background for the RCB acquisition and life cycle support. In Chapters IV and V, we analyze the data and make recommendations to answer this and other questions.

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III. RESEARCH METHODOLOGY

A. INTRODUCTION

This chapter describes the methodology used in this research—how we collected data, what questions we asked, and what process we used to analyze the data.

B. METHODS USED IN DATA COLLECTION

1. Qualitative Data

We collected qualitative data for RCB acquisition, maintenance, and life-cycle logistics from interviews with SMEs at Naval Sea Logistics Center, PEO Ships PMS325G, NECC, the CCD, and Coastal Riverine Group (CRG) 2, which was involved in both the RCB initial acquisition and life-cycle logistics issues.

2. Quantitative Data

We acquired approximately 24 months of RCB supply data from the CRG-2 supply department. This included allowancing, inventory, stock, and repair-requisitions information. COSAL reports indicated changes in allowancing since the establishment of APLs. Inventory listings identified the actual stock posture, compared to allowance levels; this enabled analysis on inventory shortages and excesses. Just as the lack of an item indicated a possible supportability problem, any oversupply was taken as a possible indication of inefficiencies. Constrained fund spent on excessive inventory could have been used for readiness issues. Among other requisition data, CRG-2 provided unclassified casualty report (CASREP) information that identified items that were implicated in unit readiness issues.

C. DATA-COLLECTION QUESTIONS

The issues identified in RDML Lewis's communication drove the data-collection strategy. This research posed questions to SMEs to frame the problem, identify root causes, and propose a solution, as follows:

1. End User/NECC

- What are the RCB readiness concerns?
- How is inventory level determined?
- What is the inventory source (DLA, NAVSUP, GSA)?
- What is the funding source?
- How is allowancing determined?
- What are the requirements?
- How is allowancing managed?
- What are the procurement issues?
- How does the weapon system interface with the supply system?
- Is there a managed COSAL for the individual units?
- Is this weapon system similar to any other supply-supported weapon system?
- What commands are the end users?
- What are the command RCB requirements?
- What is the requisition process?

2. CCD/Navy PMS325G (Program Office):

- How were requirements for the RCB identified?
- How was the GSA determined as the best method for acquisition?
- What is the process for allowancing a new weapon system?
- Would there be any substantial costs in supporting a new weapon system?
- What would the DLA role be in procuring and allowancing?
- How was program support data (PSD) initiated?
- What is the cost for a PSD?

D. OPERATIONAL AVAILABILITY

The critical question in this research is what aspects of RCB operational availability were hindered by lack of maintenance and supportability, and what solutions can be promoted in future rapid acquisitions. It would be beneficial to identify situations where limited resources were spent on items that were purchased because of improvised procurement actions.

E. SUMMARY

In the first three chapters, we briefed the acquisition of the RCB and presented the research problem. We cited pertinent laws, policies, and procedures and provided the research methodology. The following chapters present a data analysis and the recommendations of this study.

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IV. ANALYSIS

A. INTRODUCTION

The hypothesis of this research was that RCB readiness was compromised by lack of a life-cycle strategy, because of its rapid acquisition. Our analysis shows this omission could have been avoided had an LCSP been initiated as late as August 2008, upon the delivery of the second RCB. When the RCBs deployed to U.S. Central Command in January 2012, the COSAL contained fewer than 20 records, or less than five percent of the total parts cataloged for the RCB. Yet after 18 months of tracking requisitions and submitting COSAL feedback reports, the number of NSN items increased to over 250 (Ellington, 2013). Extrapolated out, the supply system should be able to support the RCB by mid-2015, 36 months after RDML Lewis expressed his concerns. Figure 6 shows the timeline of the RCB.

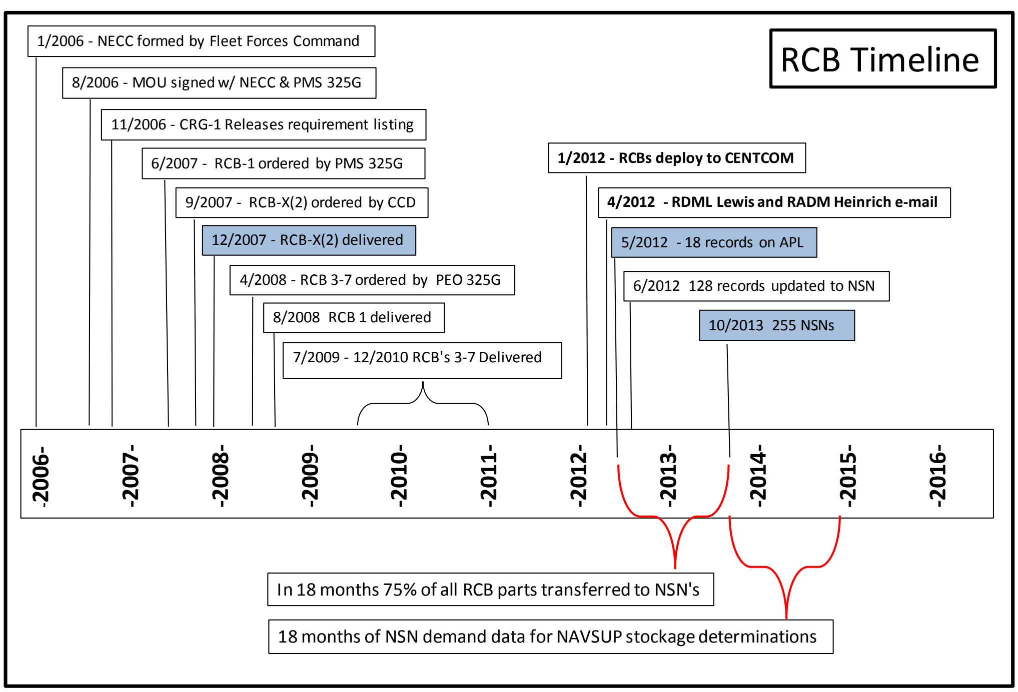

Figure 6. RCB Timeline

If requisition demand data had first been passed to NAVSUP after delivery of the second RCB, in August 2008, it is a reasonable assumption that a majority of the required parts would have been transferred to NSNs and been available in the supply system before the RCBs' first deployment. This would have assisted readiness because the availability of parts in the supply system would have provided leverage to deployed units requiring material. Instead of depending on the uncertain lead-time of commercial vendors, the warfighter could have expedited urgent requirements through the more robust supply system.

This analysis is divided into three areas. First is a close study of the problem to understand why the LCSP was not a part of the RCB acquisition. This is followed by a review of the RCB LCSP evolution after the problem was brought to flag-level attention in April 2012, when the RCB was deployed to CENTCOM. A review of the current COSAL and challenges concludes this chapter.

B. PROBLEM ANALYSIS

RCB maintenance failed because it had no LCSP focus and relied on an ad-hoc sustainment plan, from the initial delivery of RCB-X in December 2007 until the first CENTCOM deployment in January 2012. This research identifies three key enablers that led to this situation: first, the use of rapid acquisition to meet a new mission need; second, the availability of funding through Overseas Contingency Operations funding (OCO) and relaxed procurement laws from NDAA 2005; and third, the GSA's ability to rapidly procure a commercially-available platform.

1. Enablers

a. The Requirement for Rapid Acquisition

After the establishment of NECC in January 2006, CRG-1 submitted an initial requirements document to PMS 325G in August 2006. Because no existing commercial asset met the initial requirements, the

requirements were amended in a November 2006 letter citing FAR Part 10.002, which directed agencies to reevaluate requirements if they could not be met by commercial sources. Once CRG-1 reevaluated the requirements, it was determined that an existing commercial solution was available (Jordan, 2006).

b. Availability of Funding Through OCO and Relaxed Procurement Legislation

In the literature review, we discussed how the passage of NDAA 2003 streamlined the acquisition process by facilitating communication between the combatant commanders, contracting, and R&D personnel, and by removing procurement barriers. NDAA 2005 removed additional government barriers to rapid deployment of available technology. These were the key enablers for RCB funding.

c. Availability of a Platform through the GSA

After RCB requirements were adjusted by CRG-1 in November 2006, commercial procurement was ready to proceed. The GSA's establishment of the RCB on a multiple-award schedule permitted the KO to simply post the RFQ to the GSA electronic bulletin board and contact the vendor directly. This availability through the GSA, coupled with restructured requirements and access to funding, put acquisition on the fast track, and within six months of contract award, the first craft was delivered.

2. Ad-Hoc Sustainment

With no Navy sustainment plan, the vendor assembled an ad-hoc maintenance kit before deployment, consisting of vendor items. RCB training was coordinated commercially with the vendor by the end users of the RCB at NECC. This research identifies four key inhibitors in this 100 percent commercially-supported system.

a. Initial Allowance

No initial allowance was made for spares; the funding used to purchase spare parts came from the command's operating budget. An estimated minimum of $1 million was expended on an initial allowance for spares (Ellington, 2013).[2] This contradicts the P-485, which gives responsibility to the TYCOM, and not the end user, for procuring initial allowance items, thereby allowing the user to avoid spending operational funds on inventory (NAVSUP, 1997).

In the P-485, however, this allowancing process is listed as applying to ACAT III programs and above. It does clarify funding for initial spares to ACAT III (and below) programs. The RCB was procured as an abbreviated acquisition program, as displayed in Chapter II, Table 1**.**

OPNAVINST 4441.12D outlines the Navy's guidance on spares. Figure 7 is an overlay of what a traditional Navy sparing process would look like superimposed on the timeline for the RCB. As shown, there are two funding accounts used in procuring an allowance for spares. The first is at the wholesale level. This is the funding used to actually procure the material to the Navy. When the requirements are identified 18–36 months out, Navy working-capital fund (NWCF) monies are used to order the material. After the material is in the Navy's possession, the unit spends its procurement funds to get possession. This expenditure replenishes the NWCF funds that were required to procure the material.

In the case of the RCB, this should have resulted in an inventory and an allowance of material to support deployment. However, the RCB was a unique procurement. First, the RCB-X was delivered in September 2007, only 10 months after the requirements document was released by CRG-1. Between ordering and the actual receipt of the boats, the timeline was too short to

[2] In conversation with the supply officer at CRG-1, it was confirmed that though there was no official requisition identified, an estimated $1 million was spent from the unit's OPTAR account to build an inventory of anticipated required spares. These were procured commercially through Safe Boat, with no demand information fed into the supply system.

establish allowances. Since the Navy had never used the crafts before and the OEM, Safe Boat, had no experience with naval requirements, projections for spares could not be made.

A second issue is that PMS 325G was not supported by the NWCF. In the program files, PMS 325G, as a non-ACAT program, uses OPN funds for acquisition. Though PMS 325G can obligate OPN funding for three years out, the material requirements were still unknown at the time of acquisition (Coughlin, 2011). Figure 7 depicts the allowancing timeline.

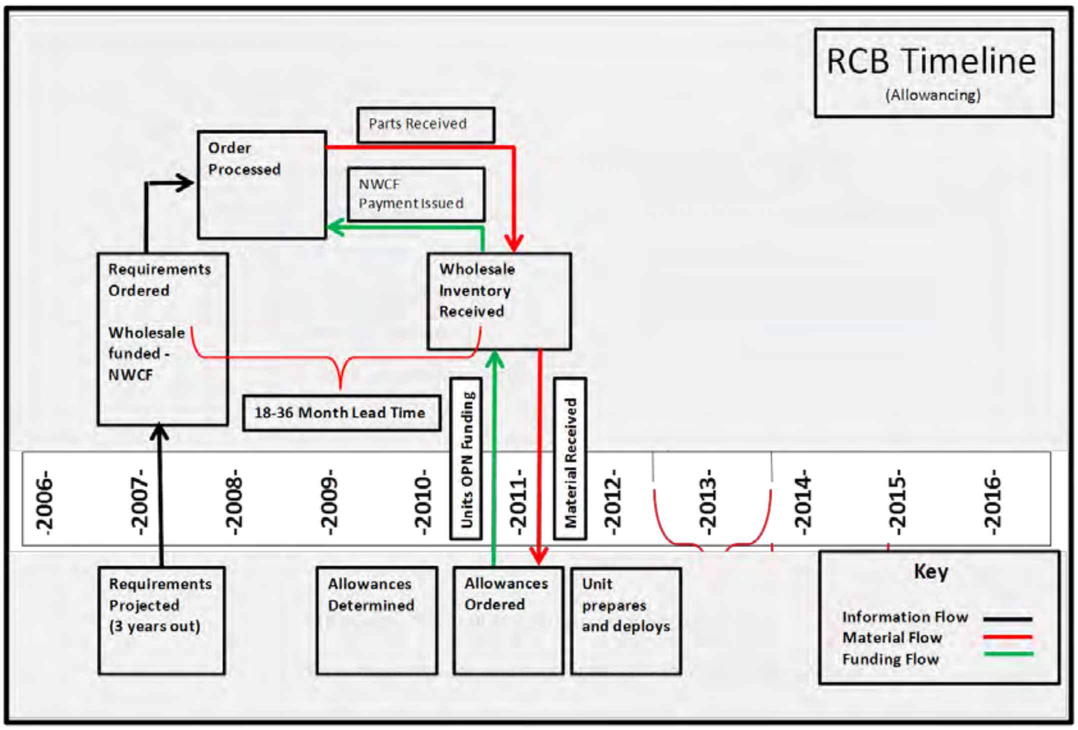

Figure 7. RCB Allowancing Timeline

b. No Formal Recording of Demand

No formal procedure was in place for recording demand. When parts were required, they were issued from the OEM repair kit. Once a part was consumed, a replacement was ordered from the OEM or another commercial vendor to restock the kit. The problem with this process is that it left no demand

fingerprint in the supply system to record transactions. If demand had been appropriately recorded, it would have shown up in the unit's APL and in new NSNs in the supply system.

Under a formal process, when a required part is not in the supply system, two actions should take place. First, a COSAL feedback report should be generated to add an allowance; and second, a "BHJ" Military Standard Requisitioning and Issue Procedures (MILSTRIP) document should be submitted to the supply system to record the demand for a commercial item (NAVSUP, 1997).

COSAL feedback reports are submitted by the end user through the 3-M department. The new part populates on the APL and an allowance is established when the next ASI is conducted. This critical step tracks changes to the weapon system and ensures allowancing. For example, during an overhaul, when systems on a ship may be added or removed, the requirements for repair parts undergo changes. Some allowances may no longer be required, while new allowances may be needed. These changes are managed through consistent COSAL maintenance. In our case study of the RCB, this was not happening. In May 2012, four and a half years after delivery of the first RCB, there were only 18 records on the APL.

In addition to submitting a COSAL feedback report—which records demands by the end user and builds the APL—a "BHJ" MILSTRIP document records the demand for a commercial item in the supply system. Over time, as demand data accumulates, the Navy assigns the part number an NSN, after which the Navy and DoD organically support the item, and the end user no longer has to rely on commercial sources. In the case of the RCB, the transition from part-number items, carried by commercial vendors to NSN items was about 18 months (Ellington, 2013).

Figure 8 is a diagram of the traditional supply requisition process that records demands and shows the flow of information and material from the

customer through the 3-M system, and therefore into the supply department of the command and the Navy's supply system. Figure 8 shows this process with an overlay of how the RCB commands procured commercial material. The component missing from the RCB process is a mechanism to capture and record demand.

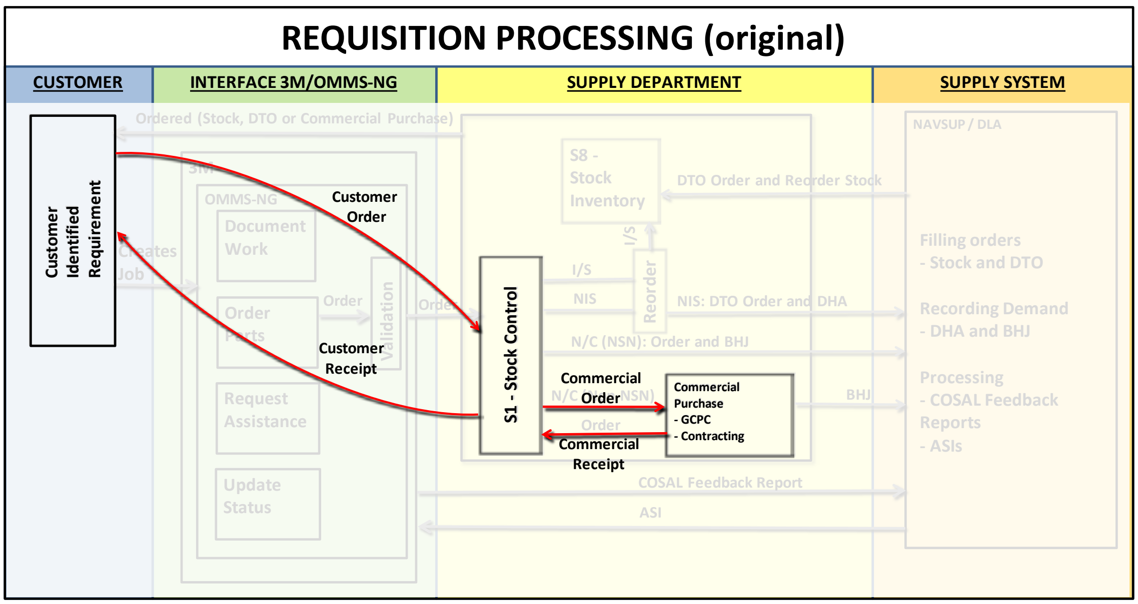

Figure 8. RCB Requisition Processing

c. Incorrect Allowance Levels

The allowance levels determined by NECC were not based on a formal COSAL allowance. The operating target (OPTAR) fund was used to establish a pool of repair parts, and there was limited demand data available to identify the range and depth of inventory to procure. Later, it was found that many of the items procured commercially for stock were not required. This resulted in an outlay of operational funds that could have been spent on deployment preparations.

This outlay is known because parts were identified as excess after they transitioned to NSNs. One attribute of an NSN is the allowance type code (ATC). A NSN's ATC is specific to the unit and assists in stocking decisions. For

example, an ATC part 4 is a demand-based item that is required many times a month and should have an allowance based on historic demand; whereas, an ATC of “6” indicates an excess part that has no demand or is not associated with any APL, and therefore should not be carried (NAVSUP, 1997).

As in the previous overhaul example, when a unit’s systems are updated, the parts for the old system are still on board. If no longer required, the parts will be flagged as excess, through COSAL maintenance in the next ASI, and labeled ATC 6. When this happened with the RCB, there were parts originally procured commercially that transitioned to NSNs, and through configuration changes or ATC updates, were identified as ATC 6—no longer required.

3. Training Issues

The last inhibitor identified was training, which was conducted commercially by the vendor. Commercial training provides benefits because the Navy is not required to expend resources on items such as curriculum development, training platforms, instructors, or infrastructure such as buildings and classrooms. The training is funded by the Navy and the footprint becomes the responsibility of the contractor.

However, we identified problems with the process used for the RCB. First, there was a problem with manning. Customarily, training is conducted with sailors prior to their arrival at a duty station. This enables a newly reporting sailor to hit the deck-plates running and immediately begin contributing to the mission of the unit by performing a specific job.

Second, for RCBs, training is driven by the end user, not the Navy. The end user is responsible for identifying personnel in its command, who may already be engaged in critical jobs, and sending them away for training. For commands with fast deployment OPTEMPOs, this is especially challenging.

These four issues—no initial allowance, no formal record of demand, incorrect allowance levels, and training issues—were major inhibitors of RCB LCSP and had consequences in their deployment in 2012. The impacts were magnified when the increased OPTEMPO of deployment precipitated maintenance needs that exceeded the training of the technicians. This brand-new weapon system had been operational for over four years and was being sent to war with an allowance of fewer than 20 parts.

C. LCSP EVOLUTION

Following the briefing between RDML Lewis and RADM Heinrich in April 2012, the RCB allowance has grown to 255 items as of September 2013. This resulted from following proper supply procedures instead of issuing parts from a repair kit and reordering them on a purchase card. Figure 9 diagrams the revised requisitioning system that put the RCB on track towards sustainable readiness in 2013.

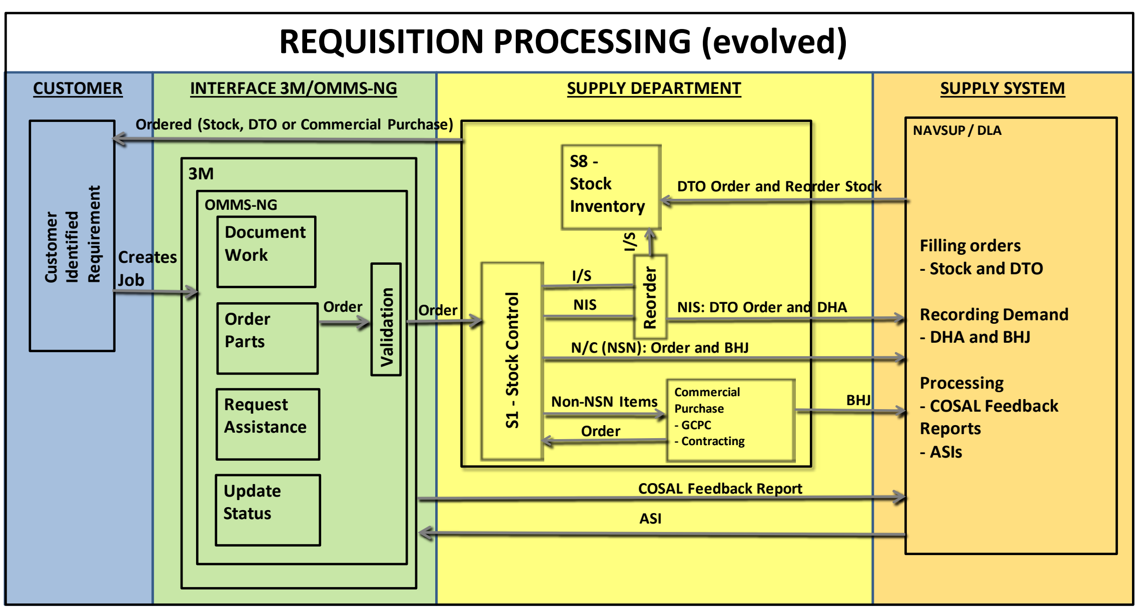

Figure 9. RCB Requisition Processing (Evolved)

The process in Figure 9 begins with the end user building a job in Organizational Maintenance Management System—Next Generation (OMMS-NG) to record work. Once the job is created, the user has the option of ordering existing parts, as listed on the APL, or new parts not listed. This is the first of many fingerprints that record demand and establish allowance levels.

If the parts required are listed in the APL, a requisition will be sent to supply and processed by stock control. If the parts are not listed, the requirement is validated by 3-M to ensure the request is correct. Once validated, the requirement goes to supply for processing.

The part request received by supply falls into one of four categories: a requirement for an NSN that is carried by the unit and has an allowance in-stock or not in-stock (I/S or NIS); an NSN that is not carried by the unit and has no allowance (N/C NSN); a part-number item that has an established allowance but has not transitioned to a NSN; or a part-number item with no allowance. Carried NSN items represent the supply department's stocked allowance items. These are either parts needed for critical repairs or demand-based parts carried because of a recurring demand that justifies an allowance.

Two actions take place when a carried item is ordered. If the item is in stock (IS), it is issued from supply, demand is recorded, and a replenishment item is ordered. If the part is not in stock (NIS), a direct turn-over requisition (DTO) is released to the supply system and, if a replacement part has not been ordered, a stock part is ordered. A DTO requisition can be ordered at higher priority than a stock document, because a DTO document is going straight to the work center, through the supply department, to fill an existing requirement—not to a shelf as stock.

Not-carried NSNs are of particular interest to the supply department, because a requirement has been generated for an item not in inventory. Once confirmed as a valid requirement from 3-M, the supply department must determine whether a stocking decision should be made. The part is ordered by

supply as a DTO item for the customer and a DHA is submitted to put a fingerprint in the supply system and record demand for a not-stocked item. Over time, after multiple demands, a stocking decision is made by supply.

A carried part-number item is a part that the unit has an allowance for, but the supply system has not assigned an NSN to. It is treated like a carried NSN, and issues are made from stock or as a DTO if NIS. The differences are, first, that the unit will submit a BHJ document to the supply system to record demand for a part number item, and, second, if there are known commercial assets, the unit will work with NAVSUP to coordinate the commercial requisition.

When the RCB was first delivered to NECC in 2007, all the parts were not-carried part-number items, because the RCB was a commercial acquisition. Since there was no allowance established with the unit to stock these parts in inventory, and no NSN assigned, the supply system was not stocking these parts. There are a few problems with not-carried part-number items. The first is availability. Since these part-number items are not in the supply system, their availability is limited to commercial sources. It is important that "BHJ" documents be submitted to capture demand and assist with the transition to a stocked NSN. The quicker the part number transitions, the quicker the supply system can support the requirement.

The second problem is acquisitioning. For an NSN item, requisitioning is completed with the simple submission of a MILSTRIP document into the supply system. As long as funds are available in a unit's OPTAR account and the part desired is available in the supply system, the part is processed. But procuring a part commercially, outside the supply system, presents a different set of challenges.

Commercial procurements are made either with a government commercial purchase card (GCPC) or, if the price exceeds the card's dollar limits, through FLC contracting. Commercial procurement allows for quick transactions, but the customer is dependent on the vendor and cannot expedite or track critical items

as well as he or she can in the supply system, where items can be procured under high priority and tracked daily. Another issue is that demand data is not recorded.

D. CURRENT ANALYSIS

1. NSN Health

After we reviewed the initial and revised requisition process, we analyzed parts allowances. This was possible because of a listing from CRG-2, consisting of all the parts of the RCB, and a supportability analysis of these parts performed by Naval Sea Logistics Center (NSLC). As of September 2013, there were 441 parts assigned to the RCB. The number of parts that were NSNs grew from 18 in April 2012 to 247 in September 2013. In 18 months, NSN support grew from four percent to 56 percent.

The NSLC supportability analysis took all the parts of the RCB and compiled 35 pieces of information for each NSN. Among the data provided were the allowance type code, outstanding requisitions due, average monthly demand, stock on hand, date of last demand, price, acquisition advice code, and lead-time. Three metrics—lead-time, demand, and availability—were developed from these data points to build a measure of the overall health of the NSNs in the RCB allowance.

a. Procurement Lead-Time

Consisting of two components, administrative lead-time (ALT) and production lead-time (PLT), procurement lead-time data reveals the time required to obtain items. It begins with the ALT at initiation of the requirement. The ALT is the administrative time needed to get the item. The PLT is the remaining time to produce the item, which ends with customer receipt. As displayed in Figure 10, there is large variance in the procurement lead-time for RCB items, with a range of 325 days, but most items have a lead-time between 187 and 273 days.

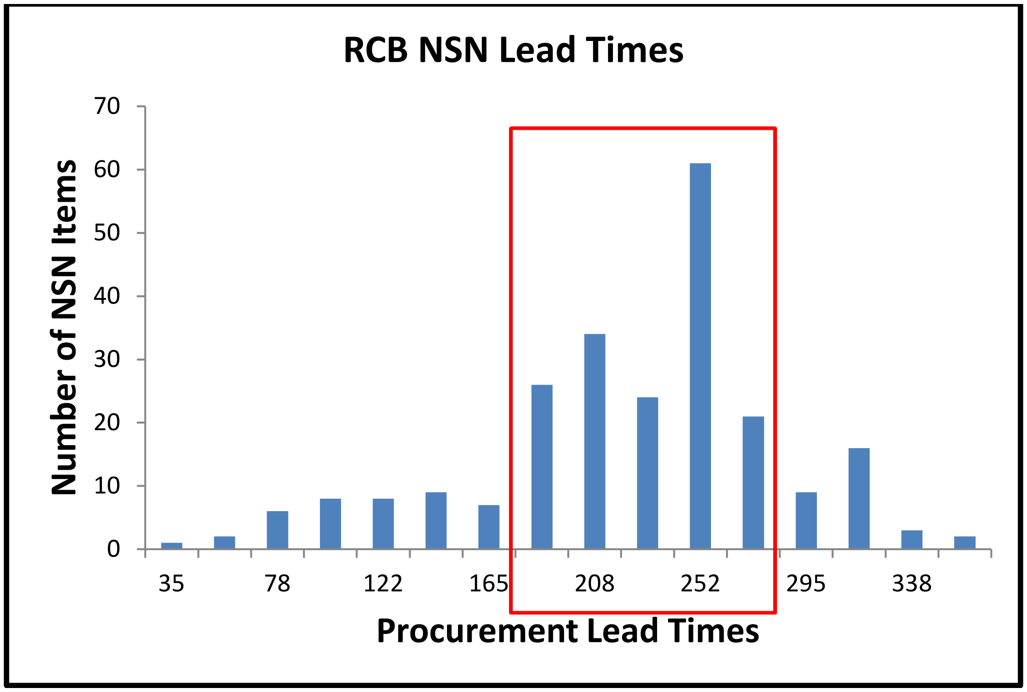

Figure 10. RCB NSN Lead-Times

b. Demand

Demand is an important metric because it can provide an estimate of what will be required in the future by looking at the past. However, for demand data to be relevant, it must be reported regularly to compile a sufficient data snapshot. The three components of the NSLC supportability analysis that help assess demand for an NSN are (a) items with demand, (b) monthly demand frequencies of an item, and (c) age of the demand data.

We must first observe that there is not demand data for all items. Only the NSNs have records in the supportability analysis. Of the 441 parts belonging to the RCB, only 247 are NSNs; the analysis is looking at only 56 percent of the RCB parts.

The second point is that there is not a lot of demand information. Of the 247 records, only 166 have been demanded in the past 12 months, and

only 38 of these had a monthly demand greater than one unit. There is monthly demand for only 15 percent of the RCB NSNs. Figure 11 presents a demand analysis.

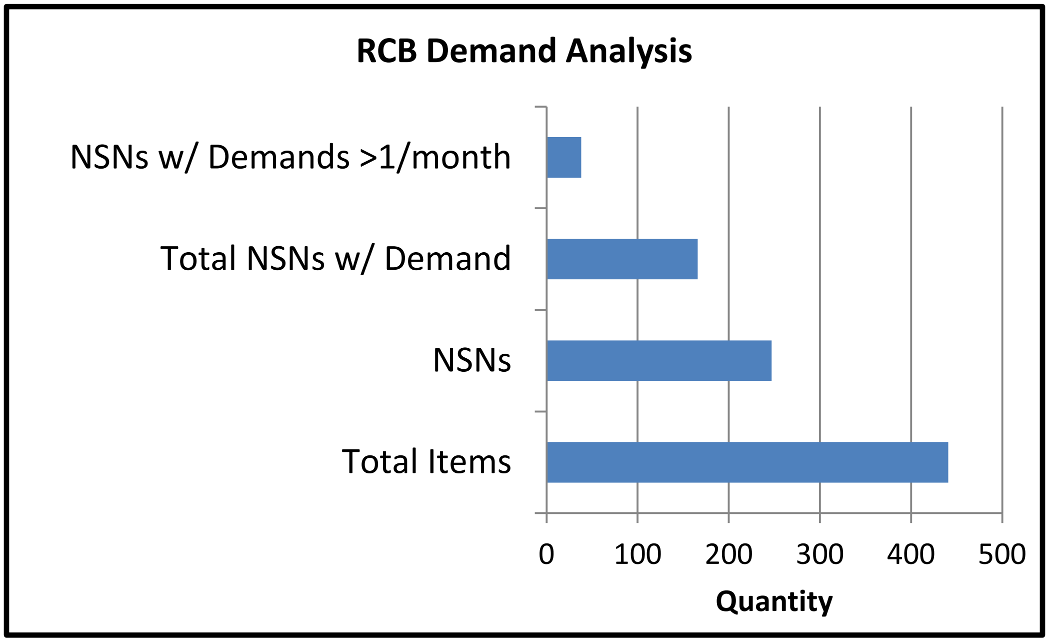

Figure 11. RCB Demand Analysis

c. Availability

Material availability is an important metric for an NSN. Just as PLT is an indication of how long it will take to acquire something after a requirement is identified, and the demand for an item is an indication on how much material has been historically required, the availability of an item is a snapshot of current inventory. This is estimated by looking at a combination of previous demand, stock-on-hand data, outstanding orders, and procurement lead-times of NSNs.

On first glance, as displayed in Figure 11, it is apparent that there are 192 items, or 78 percent of the RCB NSNs, with no stock on hand (SOH). Of these, 166 had demand hits within the past 12 months, with an average procurement lead-time of 212 days. However, just because there is no SOH, it does not mean that an item is insufficiently stocked.

Looking closer, there are only four NSNs with an average monthly demand (AMD) greater than the current stock on hand. All but one have material on contract in a quantity that is greater than 12 months of previous demand.

The four NSNs with AMD greater than SOH had outstanding requisitions against them, but also outstanding contracts to deliver above the quantities of backorders. This would seem to be a good indicator demand data collection**,** because even though the NSNs had no stock on hand, material was on contract to cover customer orders. However, the lead-times for these items ranged from 216–334 days. Without sufficient stock on hand, it would take at least six months to complete the requisition.

The availability metric is difficult to assess because it depends on the availability of robust demand data. Lack of formal demand, in combination with only 56 percent of the total parts having been assigned an NSN, and the procurement lead-times of the parts being mainly between 187–273 days, pulled unfavorably on the availability metric. Good demand data would allow managers to make accurate stocking decisions that would account for long procurement timelines. Without demand data to support procurement, procurement managers will not commit to buying inventory that will not move. Figure 12 depicts the RCB part availability of non NSN parts, NSN no stock on-hand, and NSN stock on-hand.

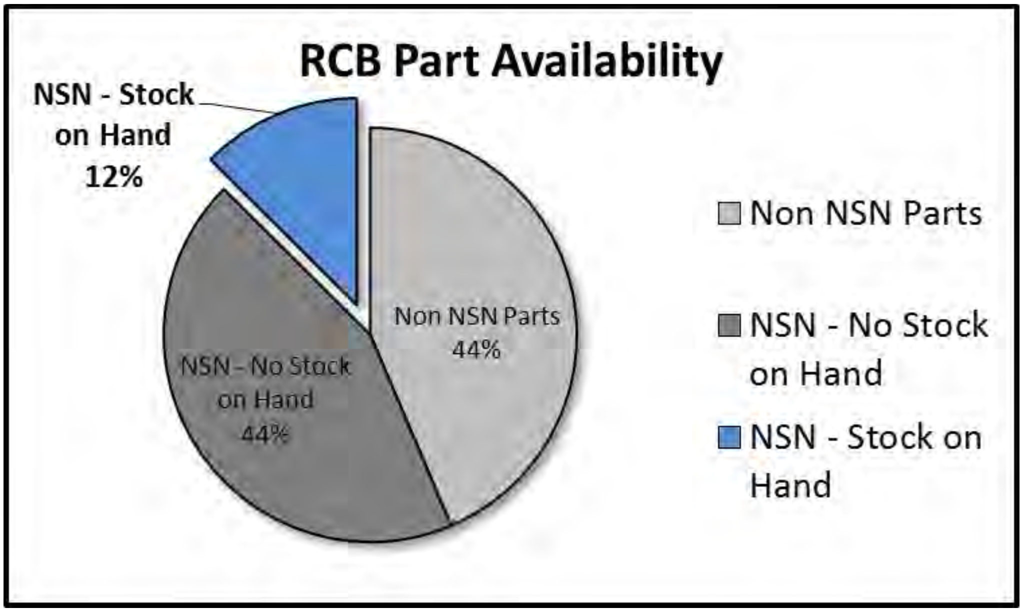

Figure 12. RCB Part Availability

2. Allowancing and Maintenance Evolution

Allowance for Navy units is established based on historical demand and initial outfitting levels. The RCB's initial allowances originated from OEM recommendations, based on the manufacturer's parts list. As noted, demands were tracked manually via a spreadsheet and parts were ordered after being consumed from the repair kit, or as required.

This situation evolved after initial procurement. Presently, there are 441 parts assigned to the RCB, with 247 of these having NSNs. Most of the parts belong to one of two RCB deployment kits. The deployment kits evolved under sourcing issues for the commercial parts.

To requisition parts through the supply system, items must have an NSN and be stocked. This was an inhibitor, because it was a commercial procurement and at the time of its first deployment in 2012, there were only 18 NSNs assigned to the allowance. With so few parts available in the supply system, most had to be procured commercially.

Two mechanisms used to procure parts commercially: the GCPC and contracting. The GCPC is for micro-purchases below $3,000 and is an efficient way to procure material. For items over $3,000, units must submit their requirements through FLC contracting, which is a much lengthier process. On the parts list for the RCB are 13 items that exceed the $3,000 GCPC threshold.

As parts were transferred to NSNs but still not available in the supply system, NECC worked with the GSA to develop deployment kits consisting of 419 of the total 441 RCB repair parts. Instead of submitting orders through contracting and experiencing lengthy delays, the deployment kits could be procured rapidly through the GSA, who had established contracts with vendors from whom end users could order.

What makes this process successful in the long run is that items on the GSA deployment kit evolve to support NSNs in the supply system. When the units consistently submits a “BHJ” MILSTRIP document along with commercial procurements, a demand signal enters the supply system and over time leads to stocking decisions for the required parts.

a. Maintenance Evolution

Just as the procurement of repair parts evolved from 100 percent commercial procurement to organic naval supply, the maintenance of the RCBs evolved from commercial to organic support. However, there was a significant period after the initial procurement in which usage data was not recorded. This was detrimental to sustainment because, as the NSN analysis revealed, there is very little demand data for the supported NSNs.

Demand data is a critical metric for stocking decisions and, as discussed, may take three years from need to availability. It is essential that users of the commercial material submit DHAs and BHJs to establish a record of demand.

As the timeline in Figure 8 shows, there was very little material transferred to organic Navy support during the first four and a half years of the RCB life cycle. All maintenance was done through OEM procedures and with OEM, or commercially procured, materials. The Navy first issued maintenance guidelines in January 2011. The class-maintenance plan for the RCB was published in February 2013. This document offered overarching guidance on maintenance objectives to users of the RCB at NECC. Figure 13 shows the time-line when MIPs, MRCs, and PMS procedures were implemented, and the publication of the CMP.

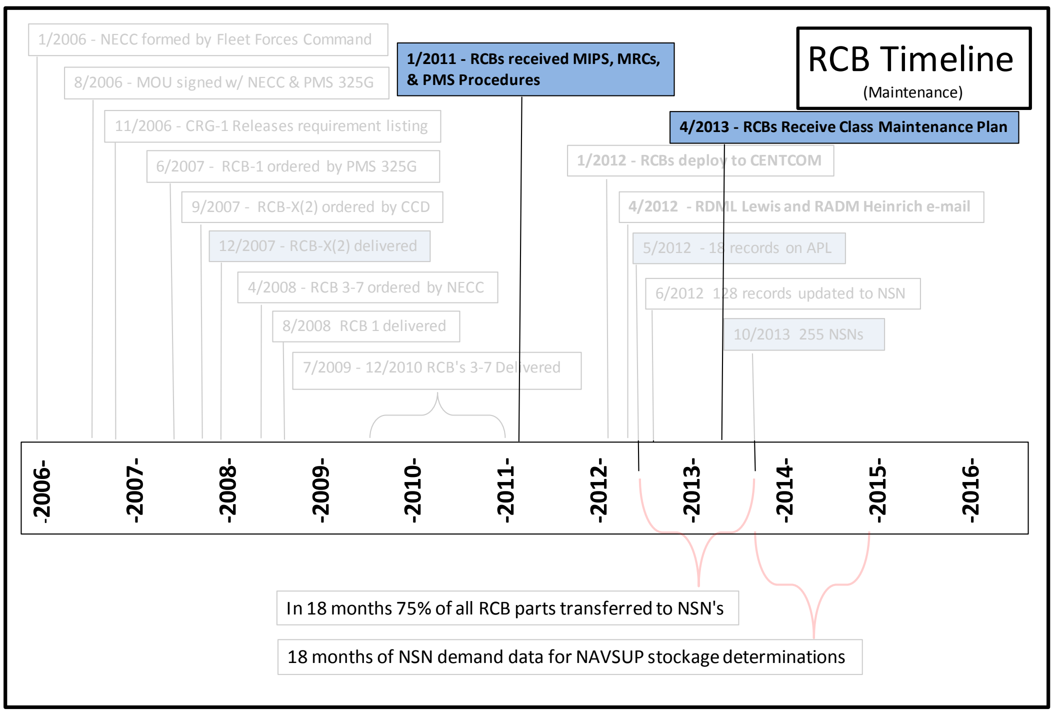

Figure 13. RCB Timeline (Maintenance)

E. SUMMARY

The RCB was a particular weapon system whose acquisition resulted from the Navy's new riverine mission, which has been done by the Navy since Vietnam. Procurement hurdles were removed to get this capability to the warfighter quickly. Those responsible for standing up RCB support at NECC,

PMS 325G, and the CCD now wish to establish allowance listings and push demand requirements into the supply system to develop organic support. Our research reviewed the actions following the procurement of the RCB to identify whether things could have been done differently to allow the supply system to support the RCBs.

Organizations are leery of making capital investments in inventory that may not move. Needed parts were not on the shelf during deployment because the demand was not known by the supply system. Nor are parts on the shelf now, because although over 56 percent of RCB parts have NSNs, there is still insufficient demand to justify stocking decisions by the supply system. The key to getting supply system support is to provide as much demand data as possible. This cumulative data will eventually result in inventory that will support a weapon system.

The RCB has limited demand data because requirements have been recorded for fewer than 18 months. Unknown material requirements for the first four and a half years resulted in the readiness addressed by RDML Lewis; but since the units have been submitting requirements into the supply system, support has increased to 56 percent of the RCB's total parts inventory.

The RCB is a realistic example of issues to come. In the past, a procurement consisting of a complex weapon system with a wide range of support functions, including research and development, logistics, inventory, infrastructure, and manning, was standard. That norm is shifting to a narrow and shallower rapid acquisition footprint. But the challenge of life-cycle management still needs to be addressed. If systems are to be rapidly procured from industry, industry needs to be a partner in the life-cycle-sustainment plan.

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V. RECOMMENDATIONS

In this investigation, we found consistent commitment to the mission, sailors, and readiness of the RCB from every stakeholder contacted, from end users at CRG-1 to the program-manager office at NAVSEA. There has been uniform determination to seeing this program succeed.

The RCB procurement was a product of a swift evolution in the acquisition process. Rapid acquisition differs markedly from traditional procedures, beginning with expectations: a rapid acquisition providing an 80 percent solution today is better than acquisition providing 100 percent tomorrow. The GSA was a great enabler in setting up rapid-acquisition capability, facilitating procurement for the DoD and the Navy, and acting as sole point of contact for the entire federal government. The GSA provided a tremendously efficient vehicle to get the RCB to the warfighter.

However, the 20 percent that fell short of an excellent solution overall became a burden on the end user. Many unknown variables had to be identified and managed; for example, how long would this weapon system be around? How large a parts inventory should be established? What are the maintenance issues? Is there commonality among the various commercial parts? Which items should be stocked in the supply system and which commercially supported?

These questions fell on users who were busy standing up a new riverine capability that had not existed since Vietnam. They were trying to anticipate the unexpected, based on their experience and knowledge of the supply system and traditional acquisition that planned for life-cycle management.

Our recommendations acknowledge these difficulties and focus on three areas. First we examine the mix of commercial and organic life-cycle-support requirements associated with the RCB. Though originally we started with a scope of three attributes—acquisition, maintenance, and sustainment—we expanded this list to training as well.

We reviewed the concept of leveraging risk using something similar to a performance-based logistics (PBL) approach, where the OEM is incentivized to assume risk and provide readiness while the government is developing organic support, working closely with the OEM.

Our third recommendation stresses the early implementation of life-cycle strategies (ILS). This includes starting ILS at the beginning of an acquisition, with a focus on developing maintenance and sustainment processes, while documenting demand, to get organic support started as soon as possible.

A. A MIX OF ORGANIC AND COMMERCIAL SUPPORT

The traditional LCSP was a means of gaining organic control and sustaining readiness. But can rapid acquisition exploit commercial efficiencies and still meet readiness requirements?

The RCB procurement originated as a 100 percent commercial buy. The acquisition was conducted through the GSA; the maintenance procedures came from the OEM; the training of the operators and maintainers was conducted by the OEM; and the spare parts were procured commercially and through a GSA deployment kit.

Though most functions of the RCB have been supported commercially, some are evolving towards organic support. The RCB craft is still procured commercially through the GSA. Training is still commercial, most recently as a sole-source contract to Safe Boat, in March 2013. NECC awarded Safe Boat a $63,000 contract to train 10 sailors for three weeks on the maintenance and operation of the RCB.

Maintenance is still partly commercial. Though conducted by crewmembers using organic maintenance procedures, there are still calls for tech support to assist with maintenance requirements beyond the scope of the OEM training. Parts support is done with a mix of hybrid and commercial support. Five

years after the RCB-X was delivered, 44 percent of parts are still commercially supported. Again, the question is whether this process can successfully meet readiness requirements.

Our conclusion is that yes—mixtures of commercial and organic support can support the RCB and meet readiness requirements. We review four life-cycle functions—acquisition, maintenance, sustainment, and training—and recommend using either commercial, organic, or a hybrid of both.

1. Acquisition

The need for a rapid boat acquisition was met through a successful commercial procurement. The RCB was designated as an abbreviated acquisition program per SECNAVINST 5000.2E and a commercial purchase under FAR Part 12, made available for procurement through the GSA. These allowed the purchase to bypass lengthy ACAT programs, and get the goods to the warfighter—but they did not address life-cycle sustainment.

a. Benefits

Commercial acquisition allowed RCB-X to be delivered three months after ordering, and three and a half years from first order in June 2007 to the last delivery in December 2010.

In addition to the advantage of the actual boats being available on the GSA schedule, multiple options allowed the tailoring of the RCB to the needs of the organization placing the order. These options included everything from armor to communications equipment, to repair kits to provide an allowance of spares to training for operators and technicians.

b. Risks

The backbone of this project can be boiled down to the risks of supportability for this commercial procurement. With everything available commercially, there was no organic support established for the life-cycle

sustainment of the RCB. With traditional weapon systems, life-cycle support is developed during procurement. With rapid acquisition, the 20 percent missing from a satisfactory procurement solution is mainly life-cycle considerations.

c. Recommendations

Awareness of life-cycle problems under rapid procurement is the first step towards developing a life-cycle plan. The RCB contracts attempted to address this concern. Each contract had additional line items for the procurement of maintenance/operator training, additional spare parts, and tech data. These critical investments should never be overlooked. The maintenance/operator training ensures that there will be an organic force available to keep the boats operational. The outlay in spare parts is critical to establish an allowance that will support maintenance requirements, because at the time of the acquisition there was no supply-system support for the RCB. The tech data that was procured with each RCB gives the government access to information that will allow development of organic capabilities. For example, the part numbers and manufacture information of RCB components is needed to submit the BHJ MILSTRIP documents to the supply system.

Over $900,000 was spent on the contract line items training, tech-data, and spares. The purpose of these expenditures was to ensure readiness and bridge the timeline between commercial support provided by the OEM and organic support provided by the supply system. While there was this initial outlay of funds for support, there was no follow through once the boat arrived to the squadrons, no stock number assigned, no demand data captured, and limited maintenance development.

2. Maintenance

Readiness requirements drive the development of an organic maintenance capability. The ability to overcome the hurdles that are presented

with a rapid acquisition must be identified and addressed at the earliest stages of acquisition. Benefits and risks of the commercial maintenance practices with the RCB are as follows.

a. Benefits

The commercial maintenance practices on the RCB had benefits. First, this was a new system and the Navy did not have an established maintenance process. They developed their maintenance doctrine from the provided OEM manuals and training.

Second, both sides were learning together. The Navy was learning how to maintain and operate this new piece of equipment and the OEM was learning how its system responded to the unique demands of naval operation. The knowledge base was growing on both sides as the RCB was integrated into riverine operations.

b. Risks

The unique forward-deployed operating environments of the RCB drove the need for an organic maintenance capability. The crew and those attached to the unit did not have the luxury of reaching back for commercial support when forward deployed. Readiness depends on the organization's ability to quickly fix an out-of-commission unit and get it back in the fight.

This requires an organic capability at the organizational level and increases the size of the RCB logistical footprint. This capability does not develop overnight, and the timeline requires early identification in the acquisition process.

c. Recommendation

The drive for the gain of organic support starts at acquisition. The maintenance component needs to aggressively identify what maintenance capabilities need developing and start developing them early. The RCB contracts tried to do this by ordering additional repair parts and buying tech data with each

RCB. This set the stage for organic support. The missing component was robust demand information that would not be available until after the RCBs were operational.

The Navy takes a lot of risk in the maintenance component of this situation. How can this risk be leveraged to ensure readiness? The establishment of a performance-based-logistics type contract with the OEM could provide incentives to the OEM for performance and shift risk away from the Navy.

Performance-based logistics (PBL) is an option used in new acquisitions to cover the period before organic sustainment is viable (Devries, 2005). The goal of a PBL contract is to increase reliability (readiness) while lowering costs (Doerr, Lewis, & Eaton, 2005). For the RCB, the OEM would be given incentive to maintain a certain readiness level while the Navy gathered data to develop organic support.

3. Sustainment

Historically, sustainment costs have represented 60–80 percent of the total life-cycle costs of a weapon system after procurement (Murphy & Taylor, 2012). The material requirements to sustain the RCB were commercially procured because the supply system did not have an organic capability. Even in October 2013, nearly three years after the last RCB was delivered to the unit, the supply system had just over 50 percent of the 400-plus parts assigned as NSNs in the supply system.

A review of the RCB contracts shows commercial procurement of supply parts was an essential component of the RCB sustainment. As Figure 14 reveals, over $498,000 was obligated to the OEM for spares procurement.[3]

[3] Data for Figure 14 comes from a culmination of the RCB contracts. It is not all inclusive of all OEM procured spares or training, only representative of the material procured at the time of the contract.

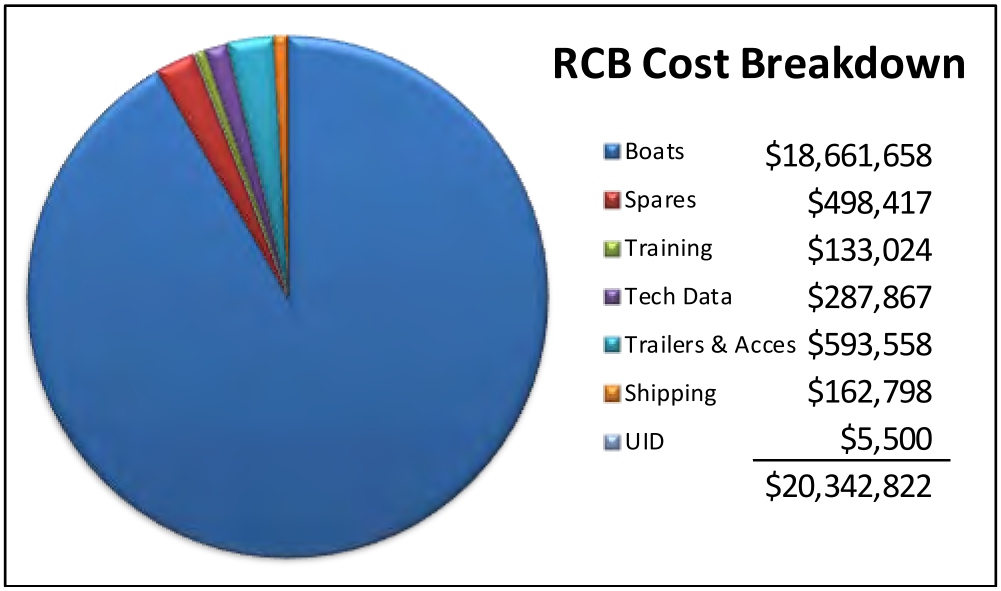

Figure 14. RCB Cost Breakdown

a. Benefits

There are several benefits associated with the commercial procurement of sustainment requirements from the OEM. First, this was an overall small weapon system with very little established demand. Even after half of the part numbers became NSNs, there was very little demand for these items to justify stocking decisions by DLA or NAVSUP. The OEM was a critical partner in RCB sustainment because it could maintain the small, slow-moving inventory more efficiently than the supply system.

Another benefit was the partnership of the GSA. One problem with open procurement of repair parts is cost. Unless the cost is under the micro-purchase threshold of the GCPC, the parts have to be procured through contracting. This means that even if a vendor had the parts on the shelf, a request from the end user would be submitted to contracting, where it would be put out for bids from various vendors. This results in long lead-times and delays for critical repair parts.

The GSA established a customized deployment kit for NECC to counter this contracting problem. The GSA did the work of the contracting office

and offered options for end users to select through their website. The advantage of this kit for the GSA was availability to all government users of the RCB, not just the Navy. The advantage for NECC was that they could quickly order their high-dollar deployment kits and not worry about lengthy contracting delays (D. Ellington, personal communication, September 2013).[4]

A third benefit of using the OEM to procure repair parts is the improvement of the life cycle of the repair parts. Having access to the unit-demand signals of the end user provides valuable data that the manufacturer can use to improve the life cycle of the parts. If the OEM is incentivized by performance metrics, the demand data can drive it to make design improvements. This is a win-win, where performance improvements result in increased unit readiness.

b. Risks

In the supply system, it is easier to expedite organic parts than it is to expedite commercial parts. The supply system has greater transparency as to what is available, and there are several metrics that can assist with decision making. In addition to inventory, the supply system provides demand history, lead-time to procure additional stock, and status on outstanding orders.

With a commercial procurement, there is competition among other external market demands. There is only so much influence that can be leveraged on a commercial vendor who is incentivized by maximizing profit, not user readiness.

Commercial parts procurement carries the responsibility to report demand to the supply system. After a commercial part number transitions to a supply system NSN, it still needs to have demand data before being carried. This is identified through the acquisition advice code of a NSN. A commercial item

[4] Through personal communications, the assistant supply officer at CRG-2 explained the process of procuring critical commercial repair parts that were not carried in the supply system but that exceeded the GCPC threshold.

initially has an advice of “J,” and once sufficient demand signals have been received in the system it will transition to a “D” and become a stock supply-system part. As discussed in Chapter IV, demand is recorded by submitting a DHJ document in the supply system (NAVSUP, 1997).

A third risk with commercial sustainment support is that no initial allowance of repair parts is established. With the RCB, an ad-hoc allowance was put together by the end users based on the OEM’s recommended repair kits. Because the units were not funded through the Navy working-capital fund (NWCF), it resulted in an outlay of the unit’s own operating funds, which could have been used to support other mission requirements. The RCBs had to outlay operational funds to procure an inventory of anticipated repair parts.

c. Recommendations

The RCBs are a very small population in the supply-system inventory. That resulted in supply-system reluctance to make outlays for stock inventory that might not move. Additionally, the RCB is part of a command that was stood up to support a specific conflict. If there is uncertainty that the mission will persist, the supply system is reluctant to invest in inventory.

Readiness depends on the effective communication of demand. The more demand communicated to the supply system, the sooner the material is carried in inventory. Big-ticket items that are critical and hard to procure should be identified to ensure availability. If the supply system does not provide inventory support, other means are needed to ensure readiness is maintained.

d. Incentivize the OEM

If the OEM is incentivized by performance metrics, it will leverage readiness gains. The OEM will pursue innovative ways to keep items operational. This innovation can be exploited by the end user to increase readiness. The result is beneficial all around.

4. Training

A sole-source contract was awarded in March 2013 to Safe Boat for instructional and technical support of the RCB. Over two and a half years after delivery of the last RCB, training is still done commercially.

a. Benefits

Commercial training makes sense. The RCB community is small, with only eight boats, and it may be cost-prohibitive to establish a naval training program for such a small population. Traditional training would require facilities, instructors, and training materials. This would increase the size of the RCB footprint and add layers between the technicians/operators and the craft.

Because of the RCB's small population, it would be a challenge to find organic Navy assets such as instructors who have current knowledge of the craft. Also, in such a community, the sailor best capable of providing training is probably better tasked to serve as an operational operator or technician. Outsourcing RCB training lets the Navy make better use of personnel.

b. Risks

There are two risks in commercial training. First, there is no guarantee that the training performed by the OEM will be applicable and relevant to unit requirements. This concern is addressed in the contract by assigning a contracting-officer's representative (COR) to work with the OEM and ensure suitability.

Second, where sailors are drawn from to attend the training is an important question. Are they sent to RCB training before reporting to their command, or is the command drawing from available personnel to fill requirements?

Training is critical to readiness objectives. However, a unit that is preparing for deployment or already deployed may not have the manning capacity to send a top sailor away for a three-week course.

c. Recommendations

The Navy should continue using the OEM to provide training because of the footprint required to establish organic training. Moreover, the OEM is the expert and would provide the most relevant training, assuming the monitoring of the COR.

However, there are real manning issues to be addressed. If sending sailors to training is detrimental to unit readiness, they should be trained before reporting to their command. Candidates could be identified through screening by CRG-1. This would ensure quality sailors for training while not drawing from the command.

B. LEVERAGING RISK

A performance-based logistics (PBL) contract incentivizes the OEM to perform. This is particularly beneficial with a new weapon system that has little or no organic support. In the early phases of the system's life cycle, the risk for performance is carried by the OEM as the user develops organic support.

1. Use of a PBL

According to DoD Directive 5000.01 (OUSD[AT&L], 2007), an evaluation by the program manager for the use of a PBL should be done for each weapon system, to determine its implementation and whether it should be provided by the public or private sector. The Defense Acquisition University (DAU) PBL guide (DAU: 2005) points out that the goal is to reduce the logistical cost of a system over its life cycle and find the right strategy mix for success. There are many types of PBLs, from completely organic to totally contractor supported, as indicated in Figure 15.

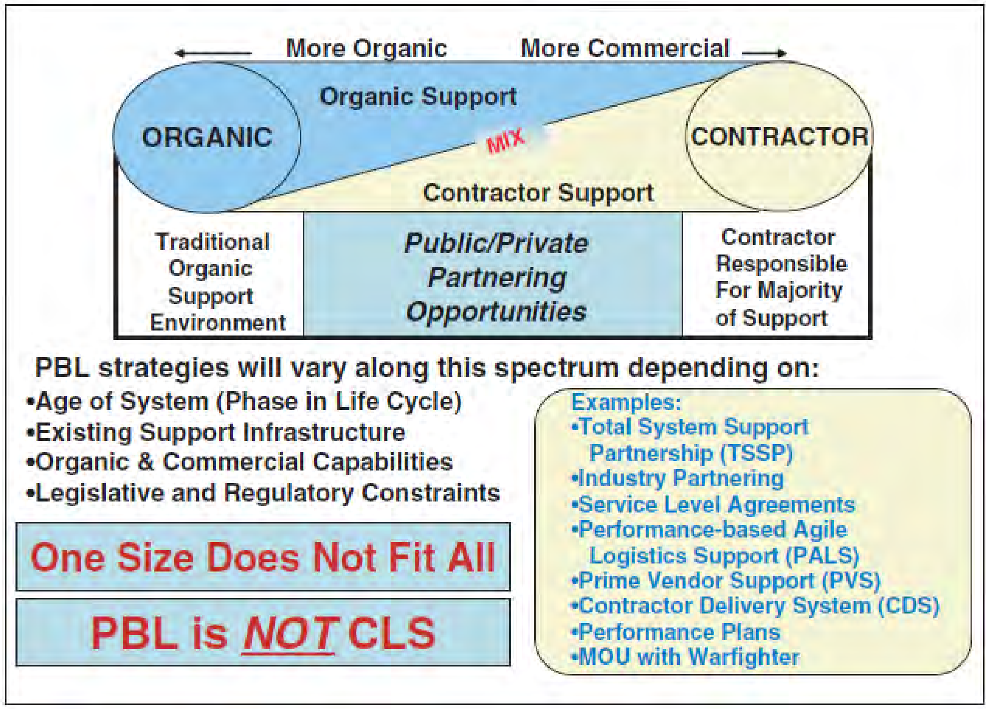

Figure 15. Spectrum of PBL Strategies (from DAU, 2005, pp. 2–3)

2. The Keys to a Successful PBL Contract

Since a PBL contract is built on performance, it is imperative that a proper metrics system be developed and identified for use during initial JCIDS development. The DAU PBL guide uses these five metrics as objectives identified by the USD(AT&L; 2004):

1. Operational availability
2. Operational reliability
3. Cost-per-unit usage
4. Logistics footprint
5. Logistics response time (pp. 2–5)

A PBL contractor's goal should be to achieve these performance metrics; it is not the government's responsibility to tell the contractor how. Each performance metric should be tailored to the needs of the end user. Three out of five of those above are the exact issues that were reported as a problem for the RCB.

3. PBL for the RCB

The RCB was procured with initial contract by the PEO PMS 325G in June 2007 and delivery in August of 2008. The RCB went operational in October of the same year, with only 16 months there was limited time for LCSP implementation. A PBL for life-cycle support could have improved the chances of RCB operational availability. The contractor who awarded the PBL would have been required to create SOPs for maintenance and ILS data gathering. The data would have been used by the supply system to generate organic support. The timeline in Figure 16 represents a hypothetical implementation of a PBL contract.

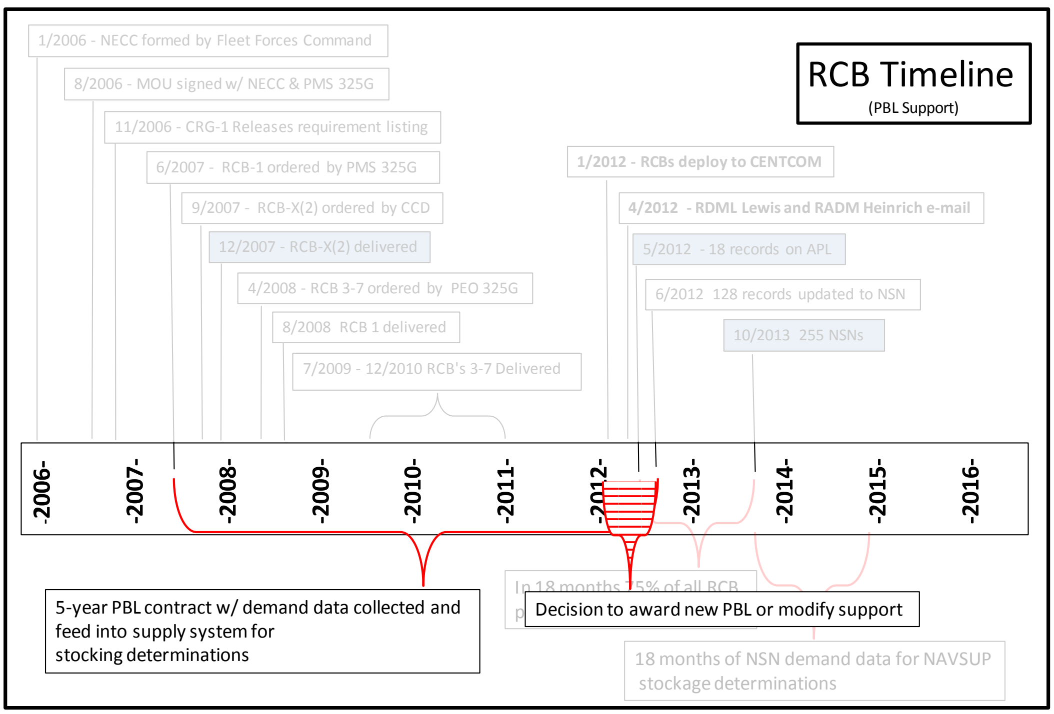

Figure 16. RCB Timeline (PBL Support)

A PBL contract is based on performance outcomes, rather than procurement of actual products (DAU, 2005). In accordance with FAR 37.602, a PBL contract contains three devices to promote success: a performance work statement so the contractor knows what is expected, an ability to measure performance against specific standards, and incentives to motivate the contractor

to reach those standards. For the RCB, this could require the contractor of PBL to be able to bring the RCB back to 100 percent operational within 48 hours of initial report while deployed, and 24 hours when in home port. This must be accomplished at least 95 percent of the time. If the contractor accomplishes these tasks, a full-award fee is paid, but if not, deductions are made to the award.

C. EARLY IMPLEMENTATION

The two keys to a successful rapid LCSP implementation are as follows:

1. Implement ILS Early

Chapter IV indicates no ILS was implemented at the beginning of the RCB procurement. The RCB was delivered with an initial spare kit and tech data, but the indications are that ILS support was not started until 2012, after the boat was on deployment. When parts were needed for maintenance, they were open-purchased by the command. Had ILS support been established at the initial acquisition phase of procurement in 2007, much of its life-cycle support would have been in place before the first RCB deployment in 2012.

2. Track and Record Demand Early

The key to getting material organically stocked is simple: track and record demand early. This allows the supply system to begin generating organic support.

D. SUMMARY

We brought forward the RCB life-cycle issues with the e-mail between Rear Admiral Lewis and Rear Admiral Heinrich. This report focused on how the RCB's LCSP should have been implemented based on laws, policies and procedures. We reviewed the data on maintenance and part requisition to understand the impact of the lack of LCSP. Finally, we provided recommendations that could have benefited the RCB, and more importantly, can be used for future rapid acquisition and the implementation of rapid LCSP.

E. FURTHER RESEARCH

The RCB is approaching the end of its useful service and the acquisition of the Mark VI as the replacement. Further study on how and when the maintenance and life-cycle support was established for the Mark VI as compared to the RCB would be beneficial in identifying the improvements.

A cost–benefit analysis on the contracted training for the maintenance and operation of the RCB verse an organic training system. NECC has yet to bring the training for the RCB into its organic capabilities and requires yearly contractor support. Cost savings could be identified if a program such as training the trainer or total organic training could be achieved.

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